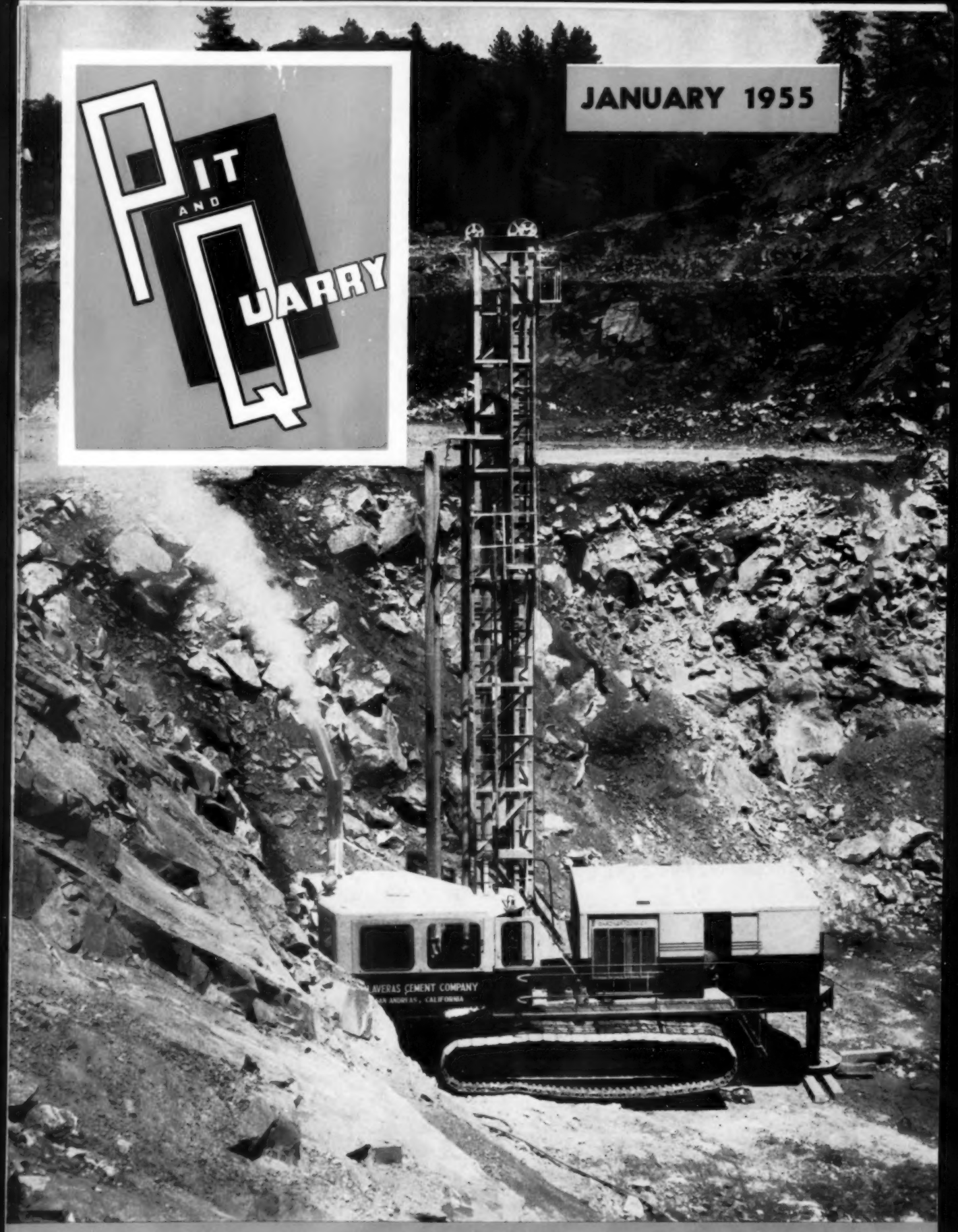
PIT AND QUARRY

JANUARY 1955



New Rotary-Type Drill in Quarry of Calaveras Cement Co. at San Andreas, Calif.

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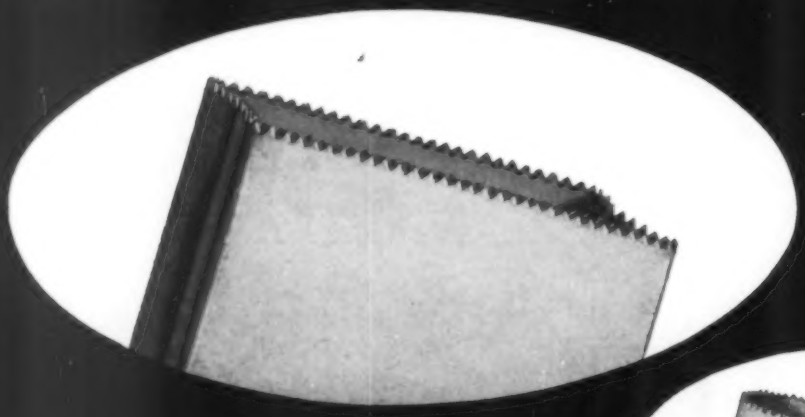
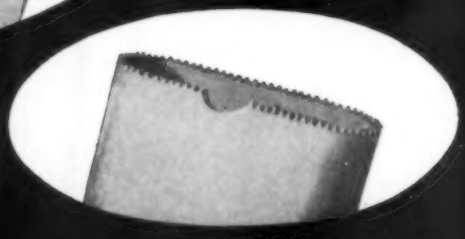


if it can be bagged...



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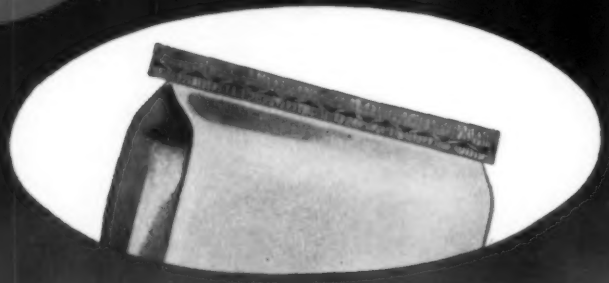

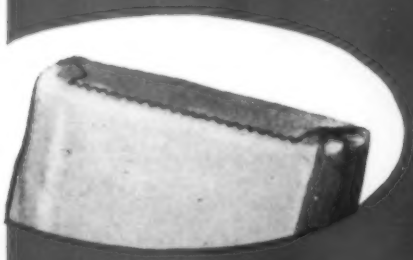

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pit and quarry

THE BASIC MAGAZINE · IN A BASIC INDUSTRY

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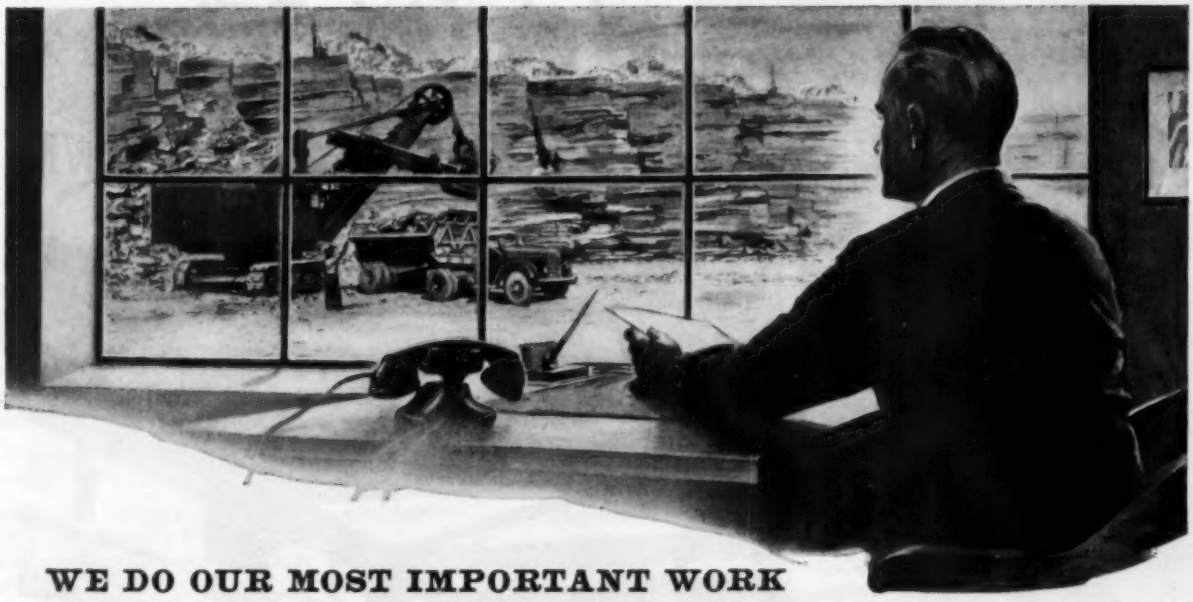
Published on the first of each month for producers and manufacturers of Cement, Crushed Stone, Gypsum, Lime, Sand, Gravel and other nonmetallic minerals. Copyright 1955 by Pit and Quarry Publications, Inc., 431 S. Dearborn Street, Chicago 5, Illinois. PIT AND QUARRY magazine was founded by H. W. Baumgartner, October, 1916.

To subscribers: When requesting change of address, kindly send old as well as new address.

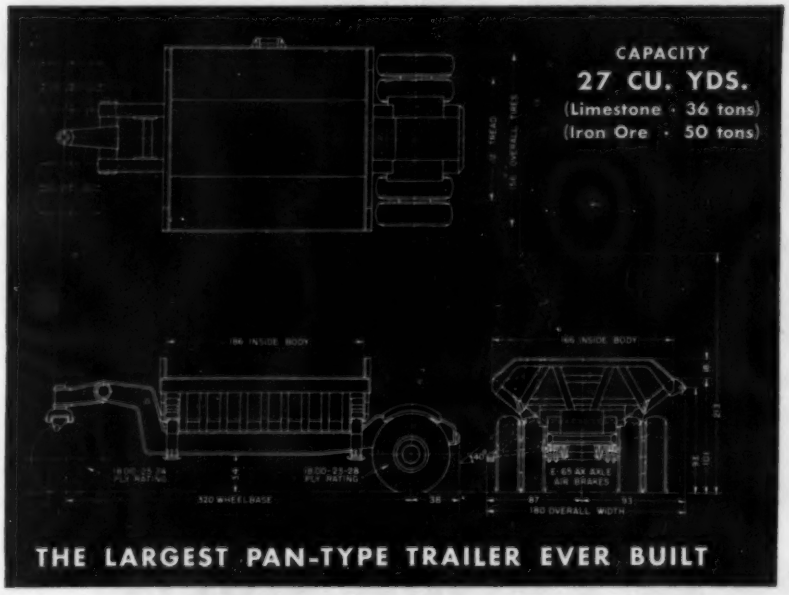


WE DO OUR MOST IMPORTANT WORK

FOR MEN WHO DARE TO THINK AHEAD

A CYCLE HAS ENDED. In a dozen years the first wide swing from rail to pneumatic-tired hauling in quarries has carried around the world. Everywhere the great cement and aggregate producing plants are hauling on rubber. Speed and flexibility far outrange the scope of ponderous old rail systems.

Through the long cycle of change the spur for every forward step has come from men who dared to think ahead. From everywhere they sought us out to work with them toward new and better means of transportation. The constant spearhead has been the now famous EASTON pan-type side-dump trailer.



No two installations of EASTON equipment have been alike. Progress in design, construction, capacity, speed, and method of application runs at the swift day-to-day pace set by the men for whom we work. For EASTON it has been necessary to maintain complete flexibility and adaptability in manufacturing in order to meet new, unprecedented demands with immediate action.

Experience has taught us that side-dumping trailers, truck bodies, and tandems cannot be regarded as standard equipment to be delivered from available stock. While some practical and economical standards have been developed, such as the sturdy E-series axles, we have come to accept side-dumping as an idea . . . a proven, workable idea in which our background of experience provides tangible footing for the next step ahead.

• • •

NOW WE SEE, with the men who dare to look ahead, the unfolding of a splendid new panorama of industrial opportunity. We offer, from the measure of our experience, a patient, cooperative effort toward higher levels of performance and sound new economies with the side-dump idea.

Now in production at EASTON is the new Model TP-2736 Pan-Type Trailer, the largest side-dump ever built. The trailer rated at 36 tons capacity for limestone will handle 50 tons of iron ore with only minor variations in design. A tandem potential of 75 to 100 tons is indicated. The dumping mechanism for this great new trailer will be based on EASTON's exclusive background of experience in electric overhead dumping systems for mine and quarry service.

B-1066

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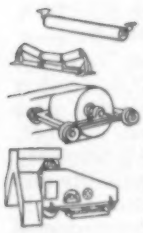

Link-Belt manufactures all components and related feeders and conveyors. You are assured of the right equipment because of this breadth of line. And Link-Belt will supply the highest grade belts engineered to the job.

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13,467-B

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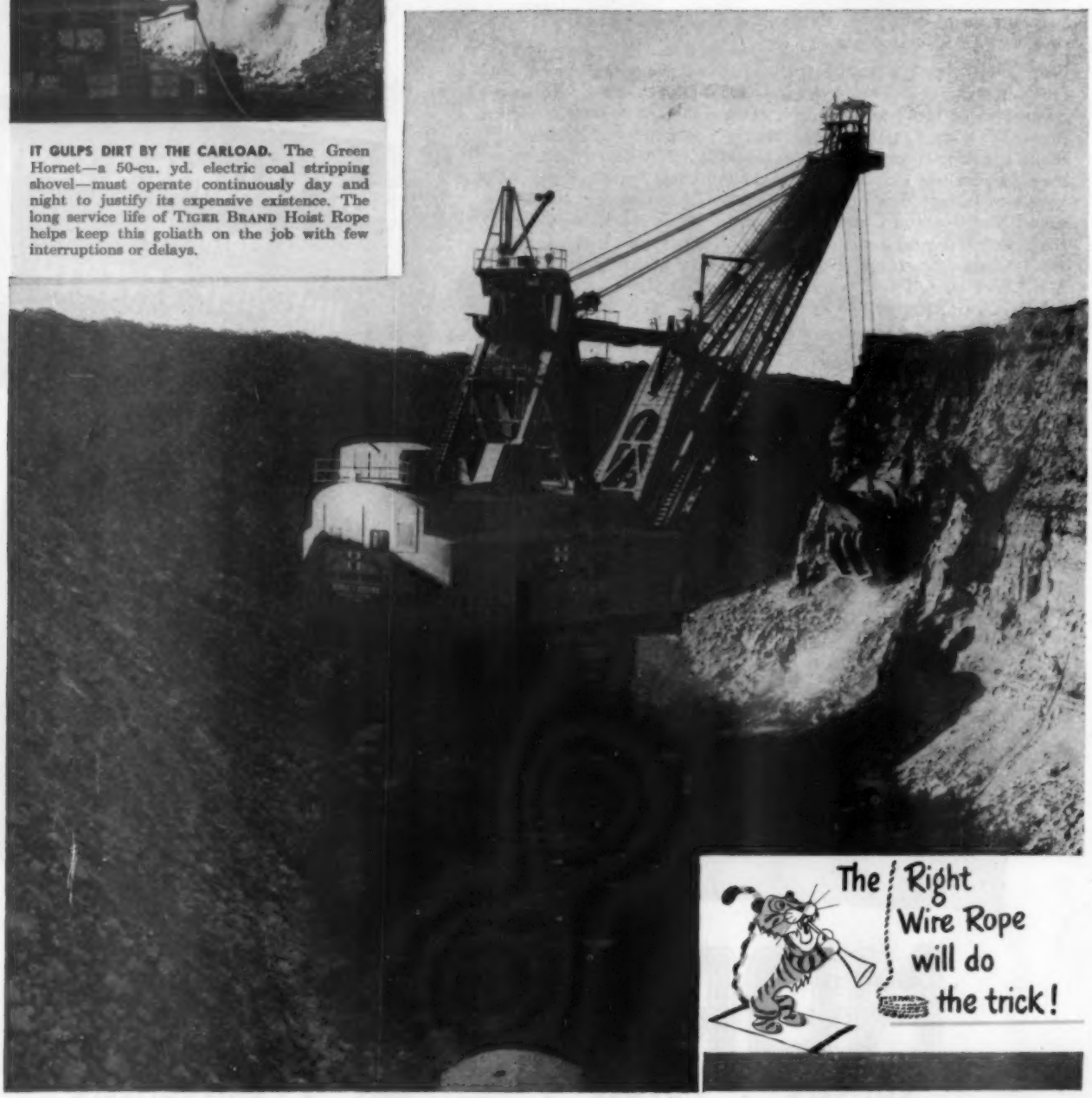
IT GULPS DIRT BY THE CARLOAD. The Green Hornet—a 50-cu. yd. electric coal stripping shovel—must operate continuously day and night to justify its expensive existence. The long service life of TIGER BRAND Hoist Rope helps keep this goliath on the job with few interruptions or delays.



yards of tough digging

Tiger Brand Hoist Rope

THE first TIGER BRAND Hoist Rope installed on this coal stripping shovel worked 65 shifts in 23 days before it was replaced. It moved 1,161,155 cu. yds. of overburden in those three weeks.

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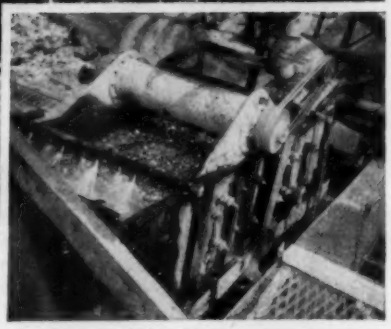
One of the most modern operations in the country, Meramec Sand and Gravel Company's new aggregates plant near Pacific, Missouri, combines a master-control, variable-speed conveyor belt blending system with nine Deister Vibrating Screens in the production of 14 sizes of gravel and sand, to meet an infinite variety of specifications to exacting degree.



Deister Type UHS Vibrating Screens—which size up to 400 tons an hour at Meramec, from minus 1½" to minus No. 4—provide faster, steadier, more efficient production through a lifetime unitized vibrating mechanism; opposed elliptical throw; and divided interchangeable screening sections.

All Deister, Top to Bottom

at Meramec's New Plant

Designed to meet the increasing demand for carefully graded aggregates blended to meet the most exacting specifications, Meramec Sand and Gravel Company's new aggregates plant near Pacific, Missouri, is setting a trend for plant design in the future.

And to size the top quality Meramec River Sand and Gravel *faster and cheaper,* Meramec standardized on Deister Vibrating Screens from top to bottom. Their decision was based on long and satisfactory experience with Deister Screens.

Scalping is done with a single deck 4 x 12 Deister, and sizing from minus 1½" to plus No. 8 is done with six double-deck 4 x 12 Deister Type UHS screens and two single-deck 4 x 8 Deister Type SL screens.

Results: Screening efficiency of the *nine Deister screens* is *high;* production volume is *excellent; exacting* specifications are being met; and maintenance has been *less than $50.00* for the first year's operation!

Deister Machine Company — pioneers in the specialized design of machinery for the aggregates industry —offers over 100 models of standard screens for any screening problem . . . in 1, 2, and 3-deck types; sizes from 2½ x 4 to 5 x 14. Write today for complete information.

Sand is sized at Meramec with two Deister Type SL Vibrating Screens in tandem, using 3000 gallons of water a minute. Like all Deister screens, the Type SL's feature fully-cushioned vibration, oil-bath operation, automatic screen cloth tension, and adjustable throw.

DEISTER MACHINE COMPANY

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editorial

1954, A Record Year for Pit and Quarry Industries

THIS January, 1955, Annual Review and Forecast Number begins the 40th year in which PIT AND QUARRY has kept its readers informed on conditions in their industries and developments affecting them. In this issue, in spite of more serious handicaps than usual, we are again presenting the latest and most complete information available at this time on conditions in 1954 and the prospects for these industries in 1955. Again we assembled all available information from government bureaus and other authoritative sources, from our own records and files, from an extensive questionnairing of these industries, and from many other sources. This year government figures on most of the nonmetallic minerals industries have fallen even farther behind than a year ago. Official reports on production, shipments and prices are available on only seven industries for even a part of 1954; complete information for 1953 is at hand on only 13 more, and on others there is not even complete information on 1952. On the affiliated concrete building units, ready mixed concrete and concrete pipe industries there is no official information since the last census of business and manufacturers in 1947. In spite of these handicaps we believe that, with the help of hundreds of producers in these industries we are able to present a fairly accurate and complete picture of conditions in these industries in 1954 and of prospects for 1955.

REVIEW Even with the incomplete information now available there is not the slightest doubt that in 1954 the non-metallic minerals industries forming the Pit and Quarry field collectively had the biggest year in history. This achievement was, of course, largely due to the increased construction volume which carried with it to new records the three largest industries in this field —cement, sand and gravel, and crushed stone. It is estimated that about $37,000,000,000 was spent in 1954 for new construction and about $15,000,000,000 for maintenance and repair. A contributing factor was the relative absence during the year of such handicaps as strikes and car, material, fuel, and labor shortages. Even the falling off in industrial production and in the demand for those non-metals used by industry could not hold down the general rise. Judging from the incomplete reports now available the dollar volume of industrial production in 1954 was slightly below the 1953 all-time record.

The portland cement industry in 1954, for the eighth consecutive year, set new all-time records in production, shipments and the value of shipments. Bureau of Mines reports for the first 10 months of the year and estimates for the remainder indicate that production was up about 2 percent, shipments about 3 percent and the value of shipments at least 4 percent over the 1953 record levels, to about 268,000,000 bbl., 269,000,000 bbl. and $730,000,000, respectively.

The latest official government figures on the production of sand and gravel, crushed stone and most other aggregates are for 1952 or earlier. Fairly accurate information on 1953 and 1954 is, however, available to us from answers to a questionnaire sent to many hundreds of established producers in all parts of the country. Our figures show that, collectively, these industries set new records of production and value in 1954 as they did in 1953. The production of sand and gravel, crushed stone and lightweight aggregates set new all-time records but slag was down from its 1953 all-time high.

The sand and gravel industry in 1954 produced an estimated 468,000,000 tons, about 3 percent over the estimated 1953 output of 454,000,000 tons which was also a record. This includes both commercial and non-commercial production and industrial sand.

The crushed stone industry in 1954 is estimated to have produced about 310,000,000 tons which is about 1 percent over the record 307,000,000 tons produced in 1953. These figures include both commercial and non-commercial production as well as agstone, but not the stone used in cement and lime manufacture. Agricultural limestone consumption in 1954 was down at least 10 percent from 1953 to 18,000,000 tons or less, the lowest level since the early 1940's.

The slag industry, which in 1953 achieved the first 30,000,000 ton year in its history, apparently was off about 10 percent to about 27,000,000 tons in 1954, due entirely to the falling off in steel production. In 1952 a similar shortage of raw material due to a prolonged steel strike also kept the volume below record levels.

The lightweight aggregates industries (including expanded slag, expanded clay-shale, perlite, pumice, etc.) apparently continued their rapid growth during 1954. There are, unfortunately, only incomplete official records of production for these comparatively young industries, but from these and our own sources of information we estimate that expanded clay-shale production was up 20 to 25 percent, cinder and volcanic aggregate consumption was up some, and expanded slag was down some due to lower steel production.

The information now available on the production of the other nonmetallic minerals industries in 1954 is even more incomplete but a slight general increase over 1953 is indicated. Partial information on 1954 is available on only six of these industries and this shows that output of bauxite, phosphate and sulphur probably set new records, while lime was down about 7 percent from its 1953 all-time high, fluorspar was off 20 percent, and gypsum was up slightly.

FORECAST Making forecasts on business volume is always a gamble but the present spirit of optimism, which is reflected in the record level of the stockmarket, indicates that the slight falling off in 1954 is is being reversed into what may be a record year in 1955. Steel production, for example, is expected to be at least 10 percent over 1954. In any case the booming construction industry, and the greatly augmented highway construction program indicate new records for the cement and aggregates industries which should also carry the other nonmetallic mineral industries to a new collective high for the Pit and Quarry field.

Walter E. Jaeger

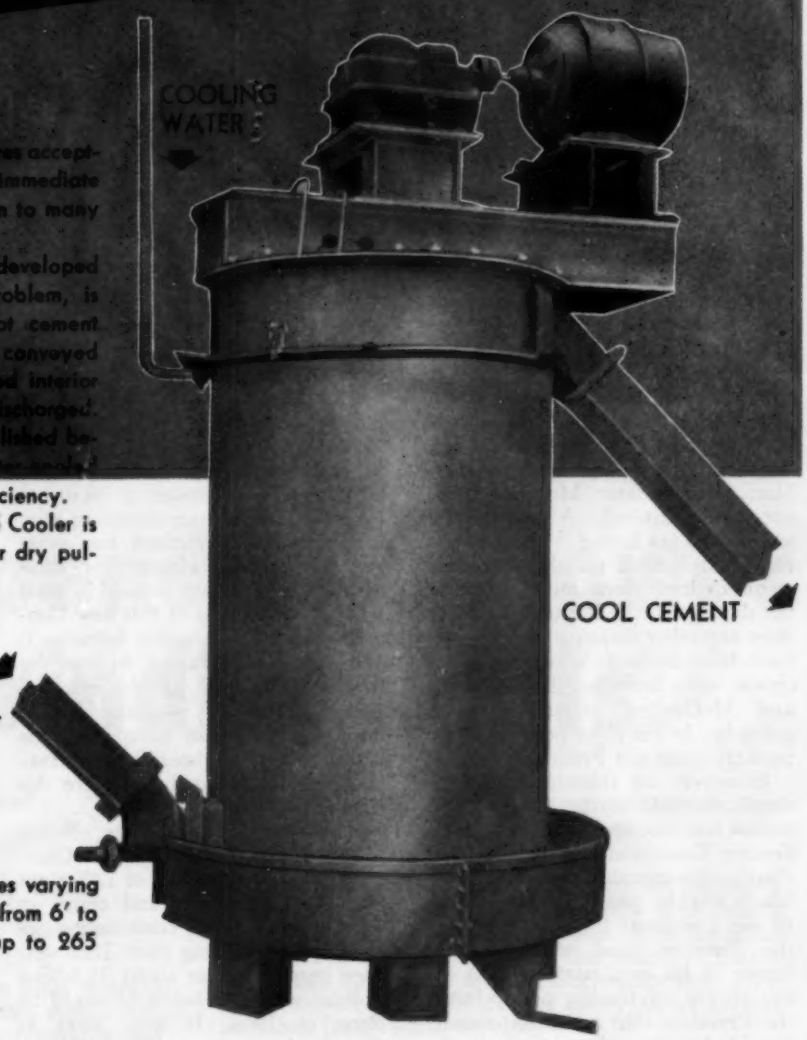
For Cooling Hot Cement

FLS

Cooling hot cement to temperatures acceptable for bulk shipment or immediate bagging is an important problem to many cement manufacturers.

The FLS Cement Cooler,* developed especially to overcome this problem, is externally water-cooled, the hot cement being introduced at the base and conveyed in a thin layer along the cooled interior surface to the top, where it is discharged. Thus an intimate contact is established between the cement and the water-cooled surface, assuring high cooling efficiency.

In addition to cement, the FLS Cooler is applicable to many other similar dry pulverized materials.



FLS Coolers are furnished in sizes varying from 3′ to 6′6″ in diameter and from 6′ to 18′ in height, with capacities up to 265 barrels of cement per hour.

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Washington News Letter

another P and Q exclusive

THE Democrats in Washington are jubilant, for they know that, at least with respect to his program, President Eisenhower is virtually their prisoner. From a long-run political point of view, they regard their situation as ideal. They do not have the responsibility for originating a program, but they can enforce an absolute veto on anything they choose, and they are practically certain that they can secure almost any compromise they want.

Recent events have, of course, added to their feeling of strength. In the McCarthy fracas, they got a numerical demonstration of the split in the Republican party and the solidarity of their own. While half the Republican senators voted for censure and half against, all the Democrats voted for censure. From their point of view, the Democrats could not have hoped for a result more favorable than this split of the Republican senatorial ranks.

Although the White House did not officially take sides in the censure issue, the President made it abundantly clear that he approved of the outcome. Certainly, the responsive blast from Senator McCarthy was not unanticipated. Although the senator did not intend it to have that result, his attack on the President seems to have done more to repair the damage to the Republican party than any other measure which could have been devised. When forced to choose sides between the President and McCarthy, practically every politician in his right political mind publicly chose the President.

However, the fracture is not so simply healed, as the fundamental debate on foreign policy between Senator Knowland and the President clearly demonstrates. Senator Knowland's warlike proposals are certain to die aborning; but the fact that the President and the senatorial leader of his own party do not see eye to eye on foreign policy forces the President into a position requiring his foreign policy to please the opposition, not only in its broad aspects but also in detail. This will not be permitted to be forgotten. If the policy succeeds, the credit must at least be shared; if it fails, the party in power will receive most of the blame, if not all of it.

There are no signs at all in Washington that this unhappy situation will correct itself. As a curious consequence, however, it is being freely predicted that the demand for the President to run for a second term will become so great—from both wings of the party—that it will be virtually irresistible. The principal substantial issue on which both factions agree is that victory is essential; and, if pressed, they would probably also agree that the only alternative to an Eisenhower candidacy is defeat.

Particularly in this period of uncertainty, comfort is frequently sought in the analogy of President Truman's situation when he also lived for two years with a Congress dominated by the opposite party and then came back to win a victory for himself and his party. The Republican pessimists always end these speculations with the observation that Eisenhower is just not the astute politician that Truman was.

What these pessimists forget, however, is that Truman was given a pretty powerful assist by booming economic conditions through 1948, the election year. The hesitation in the economy did not come until 1949, after he was elected. This fundamental economic force may have been as important a factor as his now famous barn-storming trip.

The economic outlook two years ahead is certainly cloudy, and what actually happens will depend in great part on the actions of this new Congress and the interaction between it and the Administration. At least for the year to come, all the expectations are that the economy will be buoyant, busy, and prosperous. As is usual in recent times, the construction industry forms the basis for this happy thinking.

Every year about this time, officials in the U. S. Department of Commerce and Department of Labor get their heads together and come up with an estimate of construction activity in the coming year. Last year they predicted that about 34 billion dollars' worth of building would be done in 1954. It now looks as though they were too conservative. The total for 1954 will probably reach 37 billion dollars.

For 1955 they are now predicting that new construction activity will rise another 7 percent, to $39,500,000,000. Where do they expect this activity to come from? Home building is expected to account for half of it. This would mean that there will be more houses started in 1955 than in any other year except 1950. Commercial building, particularly stores, shopping centers, and office buildings are expected to hit a new high. State and local projects, such as schools and hospitals, are expected to rise. Highway construction, especially toll roads, will be up almost 20 percent. Only in industrial construction is the downward trend, begun two years ago, expected to continue. What happened in industrial expansion is that the 1950 boom associated with the defense effort really anticipated the future. In many lines, such as steel, the capacity built then is sufficient to meet current needs.

These optimistic estimates are based on three assumptions:

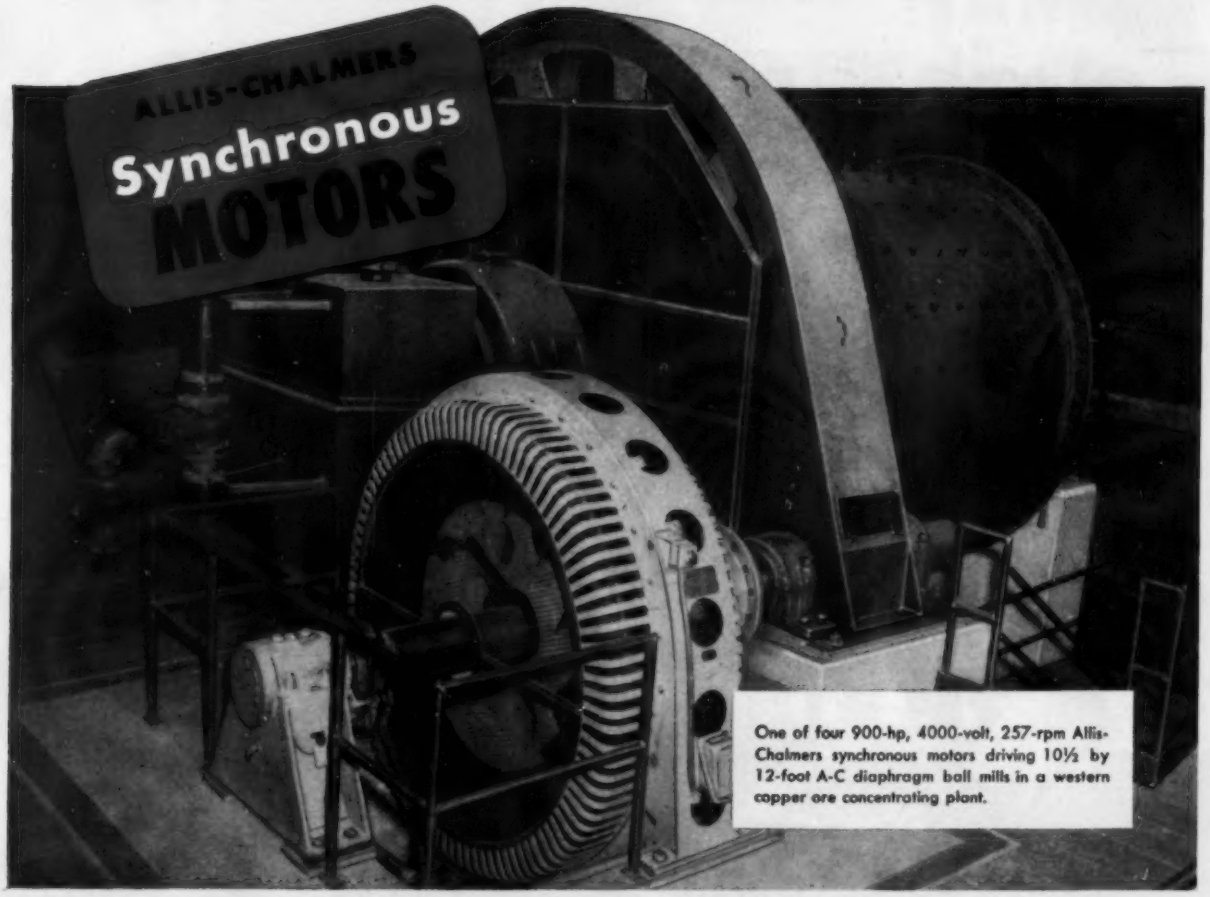
1. General business activity will continue near present levels. Recent developments indicate that this is a thoroughly reasonable assumption. The trend toward inventory reduction appears to have been stopped. For the first time in over a year, factory inventories are showing a small rise, and unfilled orders are showing a substantial increase. In addition, the demand for steel, automobiles, textiles, and other basic commodities is strengthening.

2. Individual incomes will continue near present levels. Actually, the government estimates that there will be an increase in individual incomes in 1955. Even if that increase does not materialize, individuals are likely to have more money available for current spending because, for the first time in several years, there will be a drop in fixed obligations. Many of the installment sales made in the boom year, 1953, which tied up a great deal of income in 1954, are paid for by now. This releases income for further purchases.

3. Credit will be available to finance a large volume of construction. The Housing Act of 1954 liberalized down payment requirements and assured that a substantial amount of financing for home construction would be available.

In so far as financing industrial construction is concerned, a recent survey made by the Society of Industrial Realtors indicated that there was a great deal of industrial mortgage money available at attractive rates—as low as 4½ percent.

The latest prediction, that the building boom will continue, appears to be supportable. Whether that boom will continue to sustain the rest of the economy, is a question.



One of four 900-hp, 4000-volt, 257-rpm Allis-Chalmers synchronous motors driving 10½ by 12-foot A-C diaphragm ball mills in a western copper ore concentrating plant.

Here's Dependable Power for Grinding Mills

Motor design closely coordinated with grinding mill torque requirements and system power factor needs

Many cost-conscious operators, like this western copper ore concentrating plant, choose Allis-Chalmers synchronous motors for peak performance and low maintenance costs. Allis-Chalmers builds both processing machinery and the electrical equipment to drive it. Allis-Chalmers intimate knowledge of operating conditions is full assurance that the motors will not only meet daily operating requirements but will also handle unusual emergency conditions without faltering.

Allis-Chalmers has always been known for building the heavy-duty type of equipment that mining and processing plant operators need. This tradition of generous construction plus the latest in manufacturing, inspection and testing equipment gives you a motor that will deliver many years of economical, trouble-free service.

For more information on synchronous motors that keep costs down, call your Allis-Chalmers representative or write for Bulletin 05B7648. Allis-Chalmers, Milwaukee 1, Wisconsin.

A4552

ALLIS-CHALMERS

Tough and versatile No. 80 Scraper moves "pay dirt" FAST

THIS matched combination of CAT* D8 Tractor and No. 80 Scraper is building a levee along Alameda creek, near Centerville, Calif., preparatory to stripping pit run sand and gravel. It is one of two Caterpillar rigs owned by Rhodes and Jamieson, Ltd., of Centerville. Nothing is wasted on this operation. The rich overburden—from what was 100 acres of farmland—is sold locally as topsoil. Here are some of the ways in which the No. 80 Scraper contributes to the operation's efficiency:

Versatility—This one unit can both strip and haul. It can make hairpin turns in tight quarters with its rugged ball-and-socket hitch. And with its freedom from overhead clutter, the No. 80 is an easy target for shovel loading.

Long work life—The Caterpillar No. 80 is designed to stand up to equipment-busting work around rock and frozen materials. Cutting edges are tough carbon steel, "Hi-Electro" hardened and reversible for even longer work life.

Fast cycle times—Bowl and apron design assure a boiling action for fast, full loads. (Capacity of the No. 80 is 20 heaped yards, 23 yards with sideboards.) Ejection is fast and positive, even with sticky materials. Its responsive controls are vital for "pump" loading dead materials like sand. The ground-hugging No. 80 Scraper carries 60% of the load on its rear wheels for maximum stability on slopes and in rough going. Its oversize tires stay "on top," even in wet sand.

D. A. Gildersleeve, plant manager of Rhodes and Jamieson, particularly likes the loading ability of Cat Scrapers, the availability of Caterpillar parts. Why not ask your Caterpillar Dealer for on-the-job *proof* that a Cat Scraper can cut costs on *your* operation? You can count on your dealer for skilled service and a complete stock of genuine Caterpillar parts.

Caterpillar Tractor Co., Peoria, Ill., U.S.A.

CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks—®

NAME THE DATE... YOUR DEALER WILL DEMONSTRATE

news of the industry

PIT AND QUARRY

Behre Dolbear & Company Adds T. B. Counselman To Staff of Consultants

T. B. Counselman, who was formerly associated with The Dorr Company, Engineers, Stamford, Conn., has joined Behre Dolbear and Company, New York, mineral consultants in mining, geology, metallurgy, and management.

During his 27 years with Dorr, Mr. Counselman's experience was varied and broad. He was closely associated with many developments in the concentration of iron ore in Minnesota, the application of closed-circuit grinding to the wet-process cement industry, and with blast-furnace practice in pig-iron manufacture. In recent years his primary responsibility was the development of new fields of application for Dorr's new fluidized roasting techniques as manager of the company's FluoSolids Sales Division.

Mr. Counselman has long been active in the American Institute of Mining and Metallurgical Engineers. He has held office as chairman of both the Chicago and New York sections, as the vice-chairman of the Iron and Steel Division, and chairman of the Milling Methods Committee. He was largely instrumental in the formation of the present Minerals Beneficiation Division. At present he is a vice-president of A.I.M.E. and a member of the executive committee of the board of directors.

R. L. Davis Resigns Post On Perlite Institute Staff

The resignation of Richard L. Davis as secretary-treasurer of the Perlite Institute was announced recently by Lewis Lloyd, president of this organization.

Mr. Davis, who joined Perlite Institute in February, 1952, has accepted a position as executive secretary of the New York State Society of Certified Public Accountants, with headquarters in New York City.

T. B. Counselman

Beukema New President Of U.S. Steel Corporation's Michigan Limestone Div.

The election of Christian F. Beukema as president of the Michigan Limestone Division of the United States Steel Corporation was announced recently by M. W. Reed, executive vice-president of the firm's engineering and raw materials department.

Mr. Beukema, who before his recent promotion was division vice-president, succeeds H. S. Lewis. Mr. Lewis will serve as consultant.

At a recent meeting of the board of Certain-teed Products Corporation, WILLIAM C. BAIRD, I. S. KAMPMANN JR., and F. R. WEDDINGTON were elected directors.

Coming Events

January 9-13, 1955—Miami. 39th annual convention, National Sand and Gravel Association and 25th annual convention, National Ready Mixed Concrete Association. Miami Municipal Auditorium.

January 10-13, 1955—New Orleans. Annual meeting and exhibit, American Road Builders Assn. Roosevelt Hotel.

January 17-18, 1955—Washington, D.C. Annual convention, National Agricultural Limestone Institute, Inc. Statler Hotel.

January 23-27, 1955—Chicago. 36th annual meeting, Associated Equipment Distributors. Conrad Hilton Hotel.

January 24-27, 1955—Cleveland. 35th annual convention and exhibit, National Concrete Masonry Association. Cleveland Public Auditorium.

February 7-9, 1955—Cincinnati. 38th annual convention, National Crushed Stone Association. Netherland Plaza Hotel.

February 14-17, 1955—Chicago. Annual meeting, American Institute of Mining and Metallurgical Engineers. Conrad Hilton Hotel.

February 21-24, 1955—Milwaukee. 51st annual convention, American Concrete Institute. Hotel Schroeder.

March 9-12, 1955—Boston. 47th annual convention and meeting, American Concrete Pipe Association. Sheraton-Plaza Hotel.

May 11-13, 1955—Hot Springs, Va. 20th annual meeting, National Industrial Sand Association. The Homestead.

Medusa Cement to Spend $25,000,000 on Expansion Over Five-Year Period

In a recent address before the Cleveland Society of Security Analysts, Ellery Sedgwick Jr., president of Medusa Portland Cement Company of Cleveland, related plans for a $25,000,000 expansion program which this concern will carry out over the next five years.

This announcement is in line with other expansion programs undertaken by other major cement firms since the upswing in nation-wide public works activity. Mr. Sedgwick stated the money will be spent to improve the efficiency and increase the capacity of the company's seven cement producing plants.

In forecasting future trends he continued, "In order to bring our highway system up to date, to provide classrooms for the tidal wave of school children coming along, and to provide essential water and sewer systems, it is entirely possible that public works spending might increase from $10,000,000,000 (current rate) to $20,000,000,000 a year."

Mr. Sedgwick estimated that Medusa's net earnings this year will be about $3,000,000 for a new all-time record, compared with the former high record of $1,859,735 achieved last year.

Cover Picture....

● The blast-hole drill shown on the front cover of this issue is an important part of the quarry improvement program carried out in 1954 by the Calaveras Cement Company at its San Andreas, Calif., plant. This is also the first drill of its kind on the West Coast and the first in the cement industry. It is the new Bucyrus-Erie 50-R rotary-type drill, and in this installation it is drilling 90-ft. blast holes of 7⅞-in. diameter on 27-ft. centers.

Johns-Manville's 1955 Budget Reveals $20,000,000 Expansion

The Johns-Manville Corporation plans to spend approximately an additional $20,000,000 in 1955 to expand and improve its holdings. Leslie M. Cassidy, chairman of the board, said that a part of the amount would be spent at the Marrero, Calif., plant, mostly in cost reduction surveys and improvement of working conditions.

He indicated that a large share of the sum would go to improve Canadian holdings from which the concern obtains much of its raw material.

At their recent annual meeting the Wisconsin Aglime Producers Association elected the following officers for 1955: Arthur Overgaard, president; R. W. Lutz, vice-president; Charles Coburn, secretary-treasurer; and Michael Brisch, Erwin Ellefson, and Loren D. Nellis, directors.

Edward I. Williams, president of the Riverton Lime and Stone Company, Inc., was re-elected president of the Virginia Manufacturers Association for 1955.

MERRICK

will insure Peak Weighing Efficiency in

1955

Two of three MERRICK Weightometers* employed in carloading operation at large Indiana Limestone Plant.

The above illustration is typical of Weightometer installations at hundreds of plants and in scores of industries, both at home and abroad. Above MERRICK Weightometers perform automatically and continuously the important job of weighing material flow passing over a belt conveyor. A totalized reading of weight is always available at a glance from the master weight totalizer.

The longevity and serviceability of MERRICK Weightometers is a tribute to their fine engineering design and rugged construction. By virtue of the Weightometer's straight mechanical design, maintenance is held at a minimum.

MERRICK Feedoweights* are also available for the automatic feeding and proportioning of basic materials to process by weight.

The "Books of the Year" for materials on the move: *Merrick Bulletins* 375 and 253

*Reg. U.S. Pat. Office

MERRICK SCALE MFG. CO.

180 AUTUMN STREET • PASSAIC, NEW JERSEY

TWELVE YEAR TD-14 PERFORMANCE RECORD prompts Acme to put 2 new TD-14As on expanded operations. Here one of new tractors dozes blasted limestone for shovel loading into haul trucks far below surface.

"We Worked Our TD-14 12 Years Before Trading"

Says E. H. Warren, superintendent of Acme Limestone Company's underground mine

The Acme Limestone Company, Fort Spring, West Virginia, got the low-down on durability and performance of INTERNATIONAL crawlers by working a TD-14 for 12 years piling up blasted limestone for a shovel in its underground mine.

With Acme expanding operations, this ancient crawler that took the pounding on the roughest, toughest assignment imaginable has now been replaced by two INTERNATIONAL TD-14As and dozers. They produce approximately 150 tons hourly from a 21-foot seam of high calcium limestone.

Superintendent E. H. Warren says, *"We have been 100% INTERNATIONAL on crawlers since 1942 with our first TD-14 working 12 years before being traded. The all-around production and service we get from* INTERNATIONALS *speaks for itself when we buy more as replacements."*

For a long-term, dividend-producing investment in pit or quarry crawler tractor power, see your International Industrial Power Distributor. He'll demonstrate any of the seven INTERNATIONAL crawlers equipped to do your work. Then you can see for yourself how these machines pay off with peak production in handling rock, gravel or sand at less cost.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILL.

INTERNATIONAL
INDUSTRIAL POWER

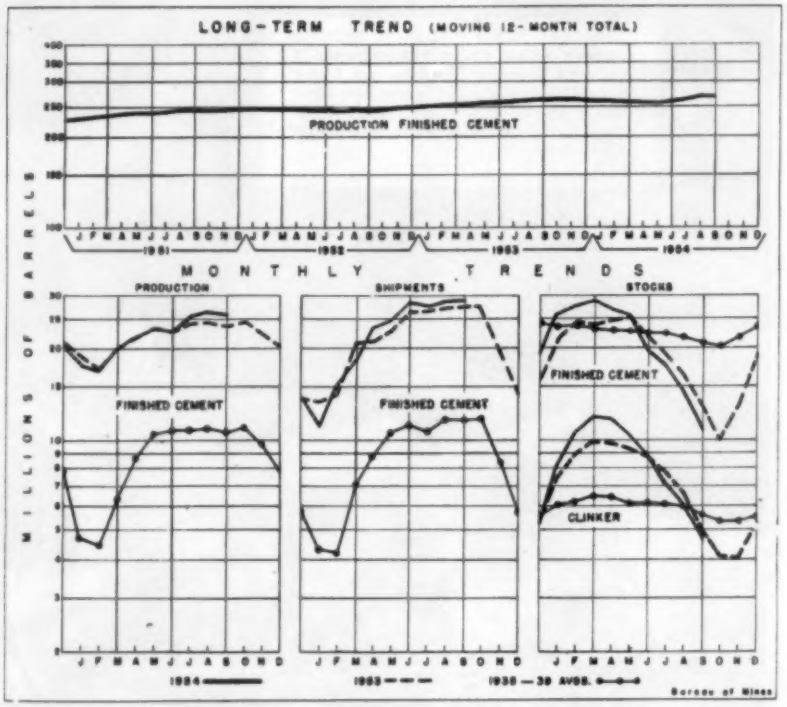
MAKES EVERY LOAD A PAYLOAD

INTERNATIONAL HARVESTER

Universal Atlas to Add 3,000,000 Bbl. Annually To Buffington Output

Charles B. Baker, president of Universal Atlas Cement Company, has announced plans for the construction of two new plants. One of the facilities, to be erected adjacent to the Buffington plant at Gary, Ind., will have a capacity of more than 3,000,000 bbl. of cement per year. Added to the present production at Buffington, the combined operation there will have a total annual capacity of 10,000,000 bbl. The proposed setup is said to be the "largest single production unit to be constructed in the industry in the last 15 years".

The second project involves the construction of a clinker-grinding plant and related facilities near Milwaukee, Wis. Completion of this unit will enable the firm to ship cement clinker by lake boat from Buffington to Milwaukee and thereby eliminate the seasonal shut-down encountered in shipping by barge. Present storage and packing facilities at Milwaukee were built in 1930. The new clinker grinding plant will more than double the amount of cement available for shipment from Milwaukee. Preliminary plans call for completion and production by the latter part of 1956.

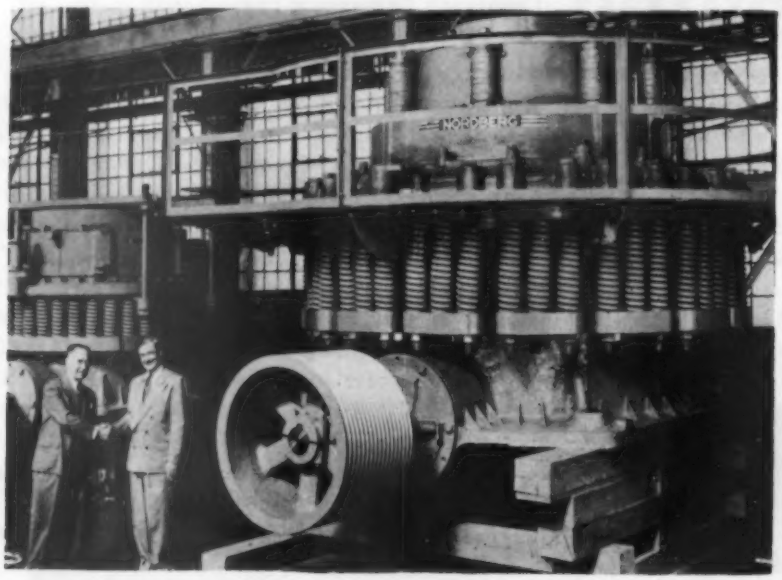


SUMMARY—Production of finished portland cement in September, 1954, totaled 25,549,000 barrels, as reported to the U.S. Bureau of Mines, a 7 percent increase from the September, 1953, figure. Mill shipments totaled 29,058,000 barrels—6 percent more than in September, 1953—while stocks of 10,890,000 barrels on hand at the end of the month were 15 percent less than on the same date a year ago. Clinker production during the month totaled 24,166,000 barrels—an increase of 9 percent from the September, 1953, total.

PRODUCTION—One hundred and fifty-seven (157) plants located in 37 states and Puerto Rico reported a production of 25,549,000 barrels of finished portland cement during the month, compared to a production of 23,795,000 barrels in September, 1953. Clinker production during the month was 24,166,000 barrels, as compared to 22,235,000 barrels during the previous September.

SHIPMENTS—Mill shipments of finished portland cement were 6 percent higher than in September, 1953, and totaled 29,058,000 barrels. Shipments were higher in 16 districts and lower in 4 districts, compared to shipments in September, 1953. The greatest increase was 24 percent in Texas, while the following districts showed gains in excess of 10 percent: Colorado-Arizona-Wyoming-Montana-Utah-Idaho, Ohio, Virginia-Georgia-Florida-Louisiana-South Carolina-Mississippi, New York-Maine, Illinois, and western Missouri-Nebraska-Oklahoma-Arkansas. Cumulative figures for the first three quarters of the year show that the greatest increases in shipments from mills occurred in the eastern Missouri-Minnesota-South Dakota and Texas districts, while the only losses were registered by the northern California, Puerto Rico, and New York-Maine districts.

● Below: Robert E. Friend, president of the Nordberg Manufacturing Co., congratulates J. B. Bond, assistant general manager and sales manager of the firm's crusher division, on the completion of the 5000th Symons cone crusher. The machine in the illustration is one of 37 heavy-duty 7-ft. crushers recently manufactured by Nordberg.



American Potash & Chemical Corporation has sold all 336 residences it owned at Trona, Calif., to its employees in order to "withdraw from the role of landlord". The only property retained by the company are the town's business district and residential quarters for unmarried employees. Trona thus becomes a county service area of San Bernardino County.

A new twist to "private parking" is being utilized by the Northwestern States Portland Cement Company, in their employees' parking lot at the plant in Mason City, Iowa. Automatic gates at the entrance are raised to permit the entry of one car at a time only upon the insertion of a special metallic card into a slot in the mechanism of the gate.

Eagle AGGREGATE WASHING-CLASSIFYING UNIT ASSURES MATERIALS TO SPECIFICATION

FOR MATERIAL TRANSIT CO., NEW CASTLE, DELAWARE

MATERIAL Transit Co., like so many producers everywhere, found that there is only one sure, economical and profitable way to wash and classify materials—the Eagle Way!

The progressive Saienni brothers, Sam, Elmer and Bill, owners of Material Transit Co., report highly satisfactory performance from their Eagle equipment, which produces a high quality concrete sand, readily meeting area specifications.

The Saienni brothers Eagle equipment consists of a 20′ Eagle Water Scalping Tank to which material flows from a nearby wet screen, and a 30″ x 25′ Long Weir, Double Screw, Fine Material Washer-Classifier-Dehydrator.

The factory-trained Eagle distributor in the area rendered yeoman service in getting the washing plant set up properly and schooling the operator.

Eagle has installed so many plants, encountered every conceivable condition, and has such broad experience that no aggregate producer need be a "guinea pig"—when you install Eagle equipment you can be sure that it will function to your satisfaction and quickly return its cost. The 82 year old Eagle organization stands back of every installation. Fast parts service is available even on the first Eagle washer built.

✔ *Get the complete story—Send for Eagle Catalog 54*

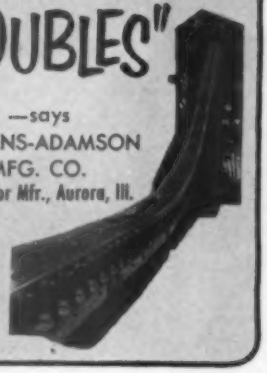
EAGLE IRON WORKS

EXPERIENCE-PROGRESS-SERVICE SINCE 1872

EAGLE IRON WORKS
133 HOLCOMB AVE.
DES MOINES, IOWA

"NO MORE LUBRICATION TROUBLES"

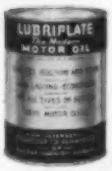
—says STEPHENS-ADAMSON MFG. CO.
Conveyor Mfr., Aurora, Ill.



"LUBRIPLATE Lubricants satisfy the 'one-shot' requirements of our conveyor idlers. LUBRIPLATE effectively lubricates each bearing in turn and flows through the hollow shaft to the next bearing. We do not know of a single case of bearing trouble through faulty lubrication where LUBRIPLATE has been used."

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE GREASE AND FLUID TYPE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE COSTS.

LUBRIPLATE is available in grease and fluid densities for every purpose... LUBRIPLATE H. D. S. MOTOR OIL meets today's exacting requirements for gasoline and diesel engines.



For nearest LUBRIPLATE distributor see Classified Telephone Directory. Send for free "LUBRIPLATE DATA BOOK"... a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.

National Crushed Stone Assn. Convention Program

Netherland Plaza, Cincinnati, Ohio, Feb. 7-9

SUNDAY, FEBRUARY 6

9:00-5:30—Registration
10:30—Meeting of Manufacturers' Division Board of Directors
2:30—Meeting of N.C.S.A. Board of Directors

MONDAY, FEBRUARY 7

8:30-5:30—Registration

Morning Session

9:15—Motion Picture
10:00—Greetings from the president—T. C. Cooke
10:10—Report of elections by Board of Directors
10:15—Report of business conditions during 1954 and outlook for 1955—a summary of reports of regional vice-presidents presented by the President—T. C. Cooke
10:30—Report of engineering director—A. T. Goldbeck
10:50—Report of field engineer—J. E. Gray
11:10—Report of administrative director—J. R. Boyd
11:30—"Significant Developments in the Highway Construction Program of Tomorrow"—Pyke Johnson, chairman, Subcommittee on Highway Development, United States Chamber of Commerce, and past-president, Automotive Safety Foundation, Washington, D.C.
12:00—Adjournment
12:30—Greeting Luncheon
Luncheon Address—"My Life as a Spy"—Countess Maria Pulaski, formerly with the British Intelligence Service

Afternoon Session

Operating Men and Equipment Manufacturers

2:30—Panel Discussion on Productive Maintenance
3:30—Ultrasonic Inspection of Quarry Equipment—F. E. Pringle, field engineering manager, Sperry Products, Inc., Danbury, Conn.
4:00—Pictorial presentations of selected topics on specific operating problems
5:00—Adjournment

Evening

6:30—Gay Nineties Party—dinner, entertainment, and dancing

TUESDAY, FEBRUARY 8

8:30-5:30—Registration

Morning Session

9:15—Motion Picture
10:00—Report on Percentage Depletion—Russell Rarey, chairman, N.C.S.A. Percentage Depletion Committee's president, Marble Cliff Quarries Company, Columbus, Ohio
10:15—Address—John F. Lane, Gall, Lane and Howe, Washington, D.C., general counsel, N.C.S.A.
10:45—Discussion
11:00—"The Concrete Industry Board, Its Plans for Improving the Quality of Portland Cement Concrete"—Roger H. Corbetta, president, Corbetta Construction Company, Inc., New York, N.Y.
11:30—"Crises Still Make Our Foreign Policy"—William G. Hetherington, news analyst and foreign correspondent, The Newark, News, and foreign radio reporter for NBC and ABC
12:00—Adjournment
12:30—Manufacturers' Division luncheon and Manufacturers' Division annual business meeting (for members of the Manufacturers' Division only)

Afternoon Session

Operating Men and Equipment Manufacturers

2:30—"Practical Aspects of Noise Control in Crushed Stone Plants"—A. B. Hoftiezer, safety supervisor, Laverack & Haines, Inc., Buffalo, N.Y.
3:00—Arrangements not yet confirmed
3:20—Fire Insurance in Quarry Operations
(a) Need for Adequate Coverage—W. E. Schmidt, vice-president-treasurer, Columbia Quarry Co., St. Louis.
(b) How We Reduced Our Premiums—Richard L. Campbell, plant engineer, Harry T. Campbell Sons' Corp., Towson, Md.
3:50—Question period
4:10—Pictorial Presentations
4:10—Jam Breaker Ahead of Feeders—J. V. Owens, vice-president, Eastern Rock Products, Inc., Utica, N.Y.
4:20—Modern Methods of Scrubbing and Rinsing Stone
4:40—Various Methods of Stripping
5:00—Adjournment
5:00-6:00—Gettogether for Manufacturers' Division's new Board of Directors

Evening

Open for individual plans and such group meetings as may be called

WEDNESDAY, FEBRUARY 9

8:30-5:30—Registration

Morning Session

9:30—Motion Picture
10:00—Committee reports
11:00—"Selling Against Resistance"—Alvin C. Busse and Richard C. Borden, sales consultants
12:00—Adjournment
12:30—General Luncheon
Presentation of N.C.S.A. Safety Contest awards—J. J. Forbes, director, United States Bureau of Mines, Department of the Interior, Washington, D.C.
"The Sunny Side of Main Street"—Hon. Harold Caldwell Kessinger, inspirational humorist, Ridgewood, N.J.

Afternoon Session

3:00—"Human Response to Blast Produced Vibrations"—Jules Jenkins, president, Vibration Measurement Engineers, Chicago.
4:00—Discussion
4:30—Adjournment

Evening

6:00—Reception
7:00—Banquet
Banquet Address—"Skulduggery at the Old Crossroads"—Art Briese, America's knight of satire, Hot Springs, Ark.

Hoist Classification Chart Available to Manufacturers

The Hydraulic Hoist and Steel Dump Body Manufacturers Association has announced the publication of a hoist classification chart. It has been published to provide a means of standardizing the capacity ratings.

The chart may be obtained from J. R. Pat Gorman, executive secretary, Hydraulic Hoist and Steel Dump Body Mfrs. Assn., 1740 F St., N.W., Washington 6, D. C.

California Portland Begins Erecting $4,000,000 Plant On Kern County Location

Awarding of a $4,240,000 contract for the construction of a 6,000-bbl.-per-day cement plant was announced recently by the California Portland Cement Company. The L. E. Dixon Company, Los Angeles, will erect the facilities on a site near Mojave in southern Kern County. Under the terms of the contract, the plant is to be completed within 250 days from December 1, 1954, when the project was started.

Included in the facilities will be two kilns, each with a capacity of 3,000 bbl. per day, to make up the plant's 6,000-bbl.-per-day capacity. Raw material is to be obtained from large deposits nearby which were located and acquired by California Portland. A rail track spur will be constructed to the plant by the Southern Pacific Railway.

This is the third plant to be constructed by the California Portland Cement Company, the parent plant being located at Colton, Calif., and the second at Rillito, Ariz., about 20 miles west of Tucson.

Cement Output, Consumption In India Show Rising Trend

The cement industry, one of the major industries in India, has made significant progress during the last decade. At present, there are 23 cement factories in the country, of which 12 are controlled by the Associated Cement Companies, Ltd., Bombay. One factory in Mysore State is owned and operated by the Mysore State Government, and there are 10 other independent units in other parts of the country.

Total installed capacity of all the producing units was 3,280,000 tons in 1950; and this figure was increased to 3,880,000 tons by 1952. Actual production of cement in India, however, has been below installed capacity. Production rose from 2,230,000 tons in 1949-50 to 3,290,000 tons in 1951-52. Cement consumption was at the rate of 2,600,000 tons in 1949; three years later rate had increased to 3,350,000 tons. About 40 percent of the total output goes to government requirements.

Dedication ceremonies were recently held to the opening of the new $300,000 quarters of the American Foundrymen's Society in Des Plaines, Ill. The building project was made possible by subscriptions from companies, individuals, and A.F.S. chapters.

The cost of a grinding ball is determined by three things: initial cost, grinding ability and wearability.

You'll find that every CF&I Grinding Ball is your best buy. Initial cost compares favorably with that of other grinding balls. Grinding ability is improved by the use of special analysis steel and by suitable heat treatment resulting in a balance between toughness and hardness. Homogeneity of the balls is maintained, resulting in even wear with self-rationing and a more effective grind. The cost per barrel of cement produced is what really counts. Available in sizes from ¾ inch to 5 inches.

For full details, contact our nearest sales office.

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Fred A. Manske Appointed Executive Vice-President, New Natl. Gypsum Post

Directors of the National Gypsum Company, Buffalo, N.Y., have elected Fred A. Manske to the newly-created position of executive vice-president, according to Melvin H. Baker, chairman. Mr. Manske will

Fred A. Manske

be in charge of National Gypsum's production, operations, and sales.

Three other promotions were announced at the time of Mr. Manske's elevation to his new post. Wells F. Anderson was elected vice-president in charge of operations and manufacturing, the position formerly held by Mr. Manske. William M. North was named vice-president to assist the chairman of the board. Clifford F. Favrot, president of the Carondelet Realty Corporation of New Orleans, was elected a member of the board of directors.

William M. North

Wells F. Anderson

Mr. Manske, who is also a director of the company, has been in the gypsum industry continuously since 1923. He joined National Gypsum in 1934, and until his present appointment he has been successively assistant to the vice-president in charge of operations, production manager, vice-president in charge of manufacturing, and vice-president in charge of operations.

Mr. Anderson became affiliated with National Gypsum as production manager in 1951. In December of that year he was made vice-president in charge of production.

Mr. North was a practicing lawyer before joining the company in 1941. Before assuming his duties as assistant to the chairman earlier this year he held the following offices: administrative assistant and assistant secretary of the company, secretary, and (1952-1954) general manager of the firm's Kansas Ordnance Plant.

Mr. Favrot succeeds William M. Currie, president of Currie Products, Ltd., of Hamilton, Ont., as a director. Mr. Currie is retiring because of ill health.

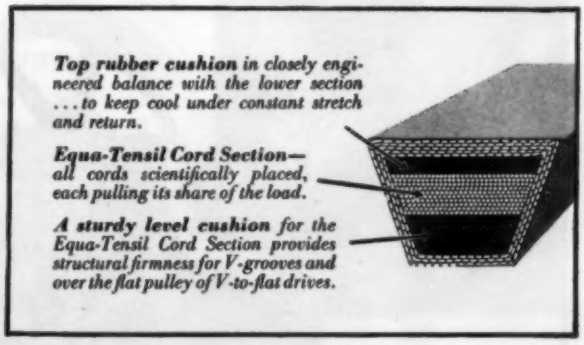
J. C. SLATER has replaced F. B. BENTON, as assistant Dallas district manager of the United States Gypsum Company. Mr. Benton is now district manager in Chicago.

● This "family portrait" of the Calaveras Cement Company's staff and sales force was taken at a recent meeting. In the front row are the following: M. Segale; J. Gordon; A. Ross, vice-president; W. W. Mein Jr., president; M. London, vice-president; G. Metzger, plant manager; J. Tedesco, treasurer; G. Mein; E. Barker, vice-president; J. Doane; T. Love Jr.; and G. Feise. Those standing are as follows: A. Maier; A. Sundell; W. Hallanan; B. Woodward; C. Evans; F. Winkler Jr.; W. Jeffrey; L. Parsons; J. White; N. Presson; L. Garrett; M. Sutton; H. Lovegreen; C. Lindgren; and D. Wadlington.

Handles MORE Horsepower... the new U. S. ROYAL SUPER-SERVICE BELT

Meet the *toughest* V-belt in the "U. S." Line. Delivering 40% more horsepower than standard belts, it also absorbs greater shock loads. Ideal where space is limited or where you want to decrease the number of belts required in order to use stock sheaves.

U.S. Royal® Super-Service is a "natural" for troublesome drives, especially heavy shock-load drives. High tensile strength, minimum stretch. All standard multiple sizes. Order from your distributor, or call any of United States Rubber Company's 27 District Sales Offices or write to address below.


***Top rubber cushion** in closely engineered balance with the lower section ...to keep cool under constant stretch and return.*
***Equa-Tensil Cord Section**— all cords scientifically placed, each pulling its share of the load.*
***A sturdy level cushion** for the Equa-Tensil Cord Section provides structural firmness for V-grooves and over the flat pulley of V-to-flat drives.*

A COMPLETE DRIVE SERVICE

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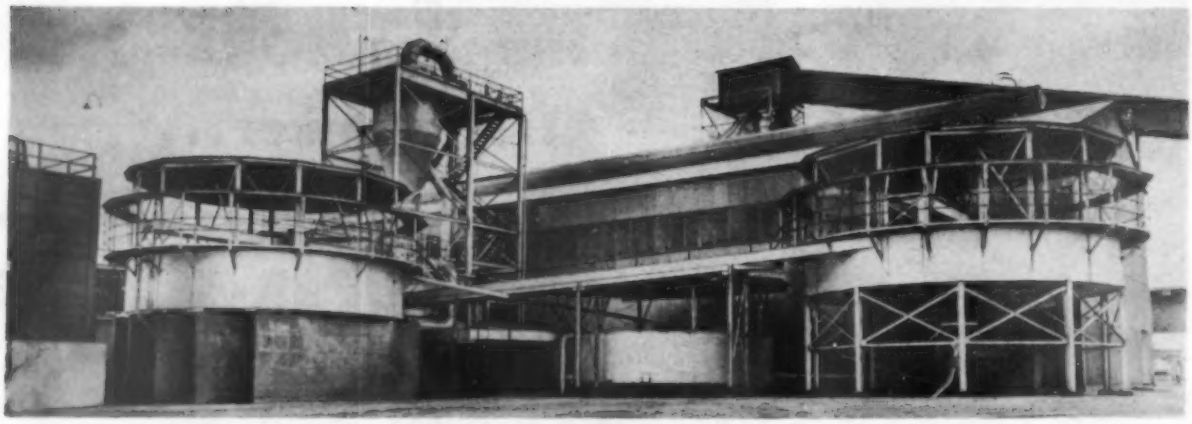


● The Duval Sulphur and Potash Company recently began operations at this plant near Carlsbad, N. M. Sedimentation and washing processes are handled by five Dorr thickeners ranging in size from 30 ft. in diameter to 120 ft. Two Dorr Duplex HX classifiers and a Dorr Hydro-separator accomplish the various classification operations. All exposed units are covered to prevent temperature increases resulting from solar rays.

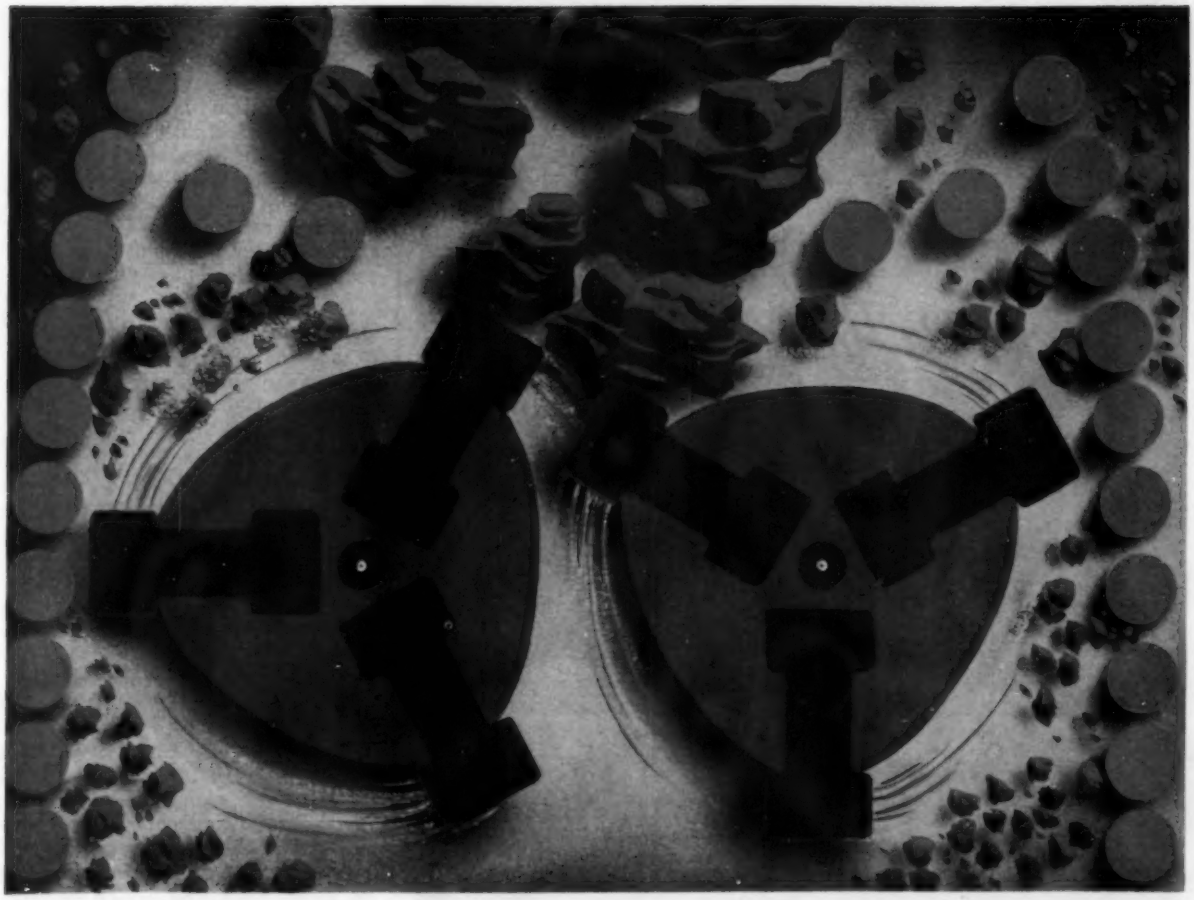
PROVEN RUGGEDNESS
for toughest crushing
Year in and year out you find more Farrel-Bacon crushers in really severe service than any other make on the market. When you examine these machines, you understand why.
The answer lies in the extremely simple mechanism and extra rugged construction of both frame and working parts. Also, Farrel-Bacon crushers, even after many years of the most abusive service, can always be brought back into first class condition, by rebabbitting, rebushing or truing up parts—at minimum cost.
Because they last so long, investment cost per year is exceptionally low.
Sizes: 60" x 48" to 10" x 7". Write for complete information or engineering assistance
FARREL-BACON
Ansonia, Conn.
BA-7

Gypsum Production, Sales Decline in Jan.-Mar. Period

Domestic mine production of crude gypsum during the first quarter of 1954, as reported to the U.S. Bureau of Mines, was 1,854,362 short tons—5 percent less than in the first quarter of 1953. However, imports were 16 percent higher and the apparent supply of crude gypsum only 1 percent lower than in the same period of 1953. Production of calcined gypsum was 2 percent under that of the corresponding quarter of 1953.

Sales of agricultural gypsum, dental and orthopedic plasters, and plateglass and terra-cotta plasters were considerably lower, percentagewise, than in the same period last year. Among the building plasters, sanded (including perlite pre-mixed) plaster continued its sharp upward trend. The combined classification of roof-deck and other building plasters increased 33 percent. Declines ranging from 8 to 16 percent each were noted in Keene's cement, gauging and molding plasters, basecoat plaster, and prepared finishes.

The Federal Portland Cement Company, Inc., Buffalo, N. Y., has started work on six new cement silos at a cost which is reported to be in excess of $250,000. The 140-ft., 43-ft. diameter structures will provide storage space for 157,000 bbl.



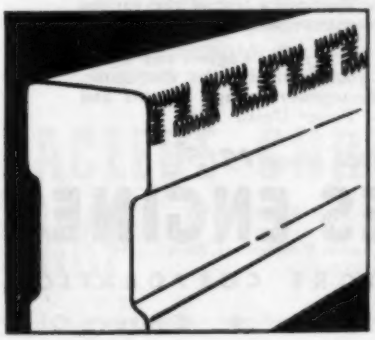
CRUSHER MAINTENANCE CUT 50% with Coated Tube Stoodite!

Crushing operations undoubtedly present one of the most savage wear problems in industry. Here's a typical example of how one operator is reducing wear, cutting costs and saving maintenance hours with Stoody hard-facing alloys.

A rock products plant in Pennsylvania, crushing hard lime rock, required the welding services of one shift each night to repair daily wear damage on their impeller type crusher. Upon recommendation of the Stoody engineer, a change in hard-facing material was made to Coated Tube Stoodite. *One shift operating every other night is now sufficient to keep this crusher in top operating condition!* Another plant operated by the same company also switched to Coated Tube Stoodite with similar results—*4 times longer breaker bar life with a big release of man-hours for other maintenance requirements!* Daily output of these two plants over the past year has averaged more than 3500 tons each per ten hour day.

APPLICATION DETAILS

Breaker bars are hard-faced with Coated Tube Stoodite only on the leading faces. Beads approximately ¾" wide and separated ¾", extend down the face 2½" to 3". They are alternately connected top and bottom. This saw-tooth pattern effects easier breakage because of improved bite, reduces hard-metal requirements and gives equal or superior results to a solid deposit. Skip welding is employed to minimize heat build-up. Succeeding applications of hard-metal are made in the spaces between previous deposits.



Coated Tube Stoodite (Stoody 1293) is a manual electrode. Deposits possess excellent impact strength and high wear resistance. These features, combined with low cost and fast deposition, make this an excellent wear-resistant alloy for most heavy equipment. Ask your Stoody dealer (consult the yellow pages of your telephone directory) for data or write direct.

STOODY COMPANY
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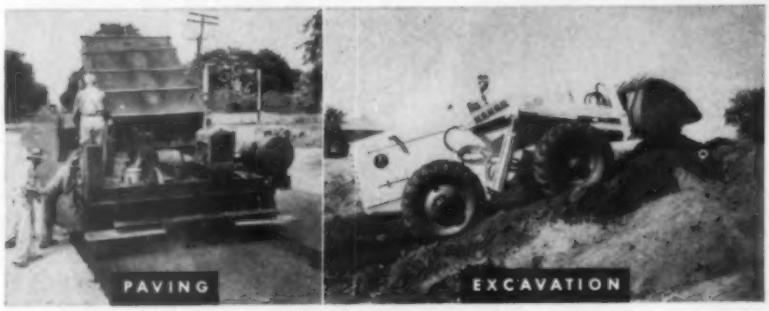
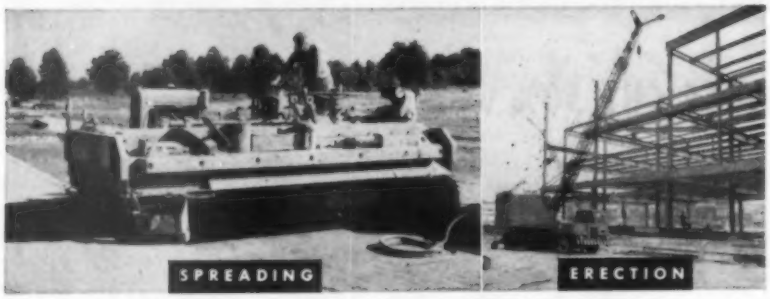
Dependable Power by HERCULES



for All Construction Needs!



Whether it's gasoline, gas or diesel powered construction equipment, dependable Hercules power is your assurance of low cost operation and a minimum of "down-time". 70 models ranging from 3 to 500 H.P. provide the right size engine for all construction needs.

If you are buying new equipment or repowering old machinery, it will pay to investigate the advantages of Hercules power. There's a "right-size" Hercules engine or power unit for your particular application. The above photographs illustrate a few of the various applications of Hercules Engines in construction machinery.

For more complete information on Hercules Engines and Power Units write the factory or contact your local Hercules distributor. Ask for Bulletin SP-136, it gives horsepower ratings, weights and dimensions on Hercules Engines and Power Units.

Engine Specialists since 1915

HERCULES ENGINES

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115 Eleventh Street, S. E. • Canton, Ohio

Modernization Projects, Rising Sales and Earnings Reported for Ideal Cement

Modernization and overhauling operations are under way at the Ideal Cement Company's plant in San Juan Bautista, Calif., which the firm took over from the Pacific Portland Cement Company. It is the first such project at this plant since Ideal acquired the facilities.

Farther north new water-borne transportation facilities were added as the firm purchased four 1,000-cu. yd. capacity steel barges for its Redwood City, Calif., plant. The vessels, purchased from the Pacific Coast Engineering Company, Alameda, Calif., will be used to carry raw material across San Francisco Bay to the plant.

Officials of Ideal also reported net earnings of $4,657,142 or $2.83 a share for the first half of 1954 compared with $4,022,188 or $2.45 a share for the like 1953 period. Sales were up to $26,350,160 from $25,528,833. Net for the second quarter was up to $3,312,169 this year from $2,709,650 last year, with sales up to $16,495,822 from $15,408,024.

President Cris Dobbins said shipments, which had lagged behind last year, took a spurt in June because of a price increase which became effective July 1. This resulted in attaining practically the same total the first half of the year as last year.

Industrial Minerals Subject Of Geological Publication

The Illinois State Geological Survey, Urbana, Ill., recently published the first of a series of *Newsletters* covering the broad field of industrial minerals. This material is being prepared by J. E. Lamar, head of the Industrial Minerals Division.

It was stated that the purpose of the publication is to present the results of minor investigations which are not sufficiently important to merit regular survey reports. The *Newsletter* will also cover by-products of Survey research on industrial minerals, and other related items.

Announcement of the sale of the E. J. Rees Cast Stone Company of Dover. Ohio, to M. J. Phillips, formerly of Pittsburgh, was recently made. Mr. Phillips said the former owner, E. J. Rees, will still be associated with the company, and that a new line of Litestone block made of expanded shale will soon be added.

New Facilities Reported In Midwest, Canada By Nonmetals Producers

Otis S. Mitchell, president of the Celotex Corporation, has announced that a larger gypsum board mill will be built and other facilities expanded at the Port Clinton, Ohio, plant. It was added that modernization work will not interrupt production. Celotex also operates plants at Fort Dodge, Iowa, and Hamlin, Tex.

General Refractories Corporation, Philadelphia, Pa., is reported to have purchased tracts totalling 847 acres in the Shoals, Ind., area and has taken options on others for the development of quartz deposits. The firm has selected a plant site between Shoals and Hindostan Falls, and well drilling has been begun.

A plant which will employ 70 workers is scheduled to be completed by the fall of 1955, according to J. D. Lowry, manager of Port Union, Ont., facilities of Canadian Johns-Manville Company, Limited. Construction will begin this fall. This plant will be used for manufacturing asbestos-cement items now being produced in the United States.

Miami River Quarries Inc., Sidney, Ohio, has leased 115 acres in the Lockington area to produce limestone and dolomite, according to the newly-formed organization committee. Operations are slated to begin soon.

The Nashville Gravel Pit, Nashville, Mich., has started producing gravel on its 200-acre site. The tract contains an estimated 2,000,000 cu. yd. of gravel and is classed as one of the largest gravel pits in Michigan. Water used for washing is piped at 1,000 g.p.m. from a 50-ft.-deep well several hundred feet away.

U.S. Bureau of Mines Offers List of Ore Testing Labs

Laboratories That Make Fire Assays, Analyses, and Tests of Ores, Minerals, Metals, and Other Inorganic Substances is the title of a U.S. Bureau of Mines bulletin listing commercial mineral testing laboratories in the United States and Canada. The booklet was prepared after numerous inquiries concerning ore testing had been received by the Bureau. The Federal Government has no facilities for such service to the public.

A copy of the publication, I.C. 7695, may be had by writing to the U.S. Bureau of Mines, Publications Distribution Section, 4800 Forbes Street, Pittsburgh 13, Pa., stating fully the number and title.

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Laclede-Christy cupola block and kiln liners for cement and lime industry.
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Name your refractory needs

What do you want? Not just the correct refractory for your purpose, but fire brick, blocks or liners that deliver *more* than you expect. You want benefits that go with this kind of service—minimum furnace down time, long furnace life and economical output. You also may want engineering service and follow-through for on-schedule performance.

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Laclede-Christy refractories—for the purpose you name—meet your most rigid requirements. "Quality first" is supsupported by many, many record performances. Laclede-Christy service is quick and helpful. The extra engineering help you may need is here too—at

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Quality First

Inaugurating a new era of service to the industrial heating industry

Canadian, U.S. Firms Report Extensive Damage from Fires

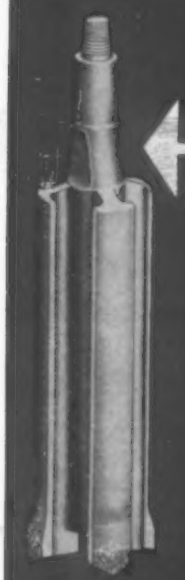
Fire, followed by a series of explosions, recently destroyed the compressor house of Montreal Quarry Ltd., Montreal, Inc., causing damage estimated at $40,000. The explosions were touched off when flames reached a supply of dynamite caps and a fuel oil storage tank.

Fire of an undetermined origin recently caused damage amounting to more than $20,000 at the plant of the Faylor Lime and Stone Company, Middleburg, Pa. Although fire companies from seven communities attempted to extinguish the blaze, a water shortage prevented them from saving more than one end of the plant.

The domestic sulphur industry produced 471,594 long tons of native sulphur and 31,900 tons of recovered sulphur (of 97 percent purity or better) during the month of July, according to the U.S. Bureau of Mines. Producers' stocks of native sulphur increased over the previous month and at the end of July stood at 3,258,821 tons.

DRILL LARGE DIAMETER HOLES THE MODERN WAY . . . WITH

SPANG FABRICATED STAR BITS



Progressive Operators Everywhere Are Discovering This Modern, Better Way Of Drilling Large Diameter Holes.

SPANG FABRICATED STAR BITS replace the conventional, old-style spudding bit and the big hole paddle-type bit. They are made in large diameters for drilling hard formations, and can be dressed, ready for drilling, by hard surfacing quickly and economically, thereby saving the time consumed heating and ramming. Made in a variety of diameters, lengths and weights, with any size joint desired, SPANG Fabricated STAR BITS are your assurance of profitable **big hole** drilling.

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SPANG PILOT-TYPE REAMER BITS ARE RECOMMENDED

PILOT-TYPE REAMER BIT

Field performance has amply proved these bits to be the driller's answer to **large hole** problems. They are made special, to your specifications and design, in any diameter; size and weight limited only by the handling capacity of conventional drilling rigs. They can be furnished to run on drilling stem or with integral rope socket top.

For detailed information on SPANG Fabricated STAR BITS and SPANG PILOT-TYPE REAMER BITS for big hole drilling, plus 52 page CATALOG, consult your nearest SPANG DEALER or write direct to

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For over 60 years Manufacturers of Spang Weldless Jars and a Complete Line of Cable System Drilling and Fishing Tools for Oil and Gas Wells, Water Wells, Prospect Drilling and Shot Blast Holes.

Mass Concrete Aggregates Subject of New Bulletin

Aggregates for Mass Concrete, a bulletin which deals with the results of investigational work in the field of aggregates for mass concrete is available from the Technical Liaison Branch of the Waterways Experiment Station, Corps of Engineers, U.S. Army, Vicksburg, Miss., for 75 cents.

The bulletin discusses petrographic techniques and their application to the study of aggregates, thermal properties of aggregates, and the procedures and equipment used by the Waterways Experiment Station in processing aggregates in the laboratory.

Bureau of Mines Report Cites Work Under New Act

The co-operation received from state mining officials, coal-mine management, and labor during the first year of operation under mandatory provisions of the new Federal Coal Mine Safety Act is emphasized in the annual report of the U.S. Bureau of Mines for the fiscal year ending June 30, 1953.

Nearly 1,500 tests were made of permissible and special explosives and hazardous chemicals during the year, and explosive characteristics of 80 different dusts were studied. The Bureau also collected data on foreign minerals, gave technologic aid to friendly nations, and trained students from these nations in American techniques.

Showings of films from the Bureau's free loan library of informational motion pictures reached an all-time high during the year. Experiments continued on mullite, block talc, and synthetic mica; and problems of asbestos and sulphur supply were attacked.

Sale of the Jackson-Bangor Slate Company property near Pen Argyl, Pa., to Anthony Dally & Sons, Inc., was announced recently. Included in the 217-acre holdings are seven slate quarries, one of which (No. 6) has been operated by the Dally firm for the last seven years. The new owners will continue operating this quarry and tentative plans are under way for developing another in the group.

A $10,000 research grant for further studies at the Bureau of Reclamation Engineering center in Denver, Colo., on basic chemical and physical reactions involved in the setting of cement has been pledged by the National Science Foundation.

Eaton 2-speed Axles have 4 Planetary Gears to share the load

- Gear-tooth loads are distributed over several rugged gear teeth.
- The husky planetary pinions turn only in the low speed range; in high speed they are locked out.
- Stress and wear are reduced to a minimum.
- Gear speeds are slower.
- Quiet operation and easy clash-free shifting are assured at all truck speeds.
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- Simple common-sense design assures easy, low-cost maintenance.

Ask your truck dealer for complete information.

More than Two Million Eaton Axles in Trucks Today!

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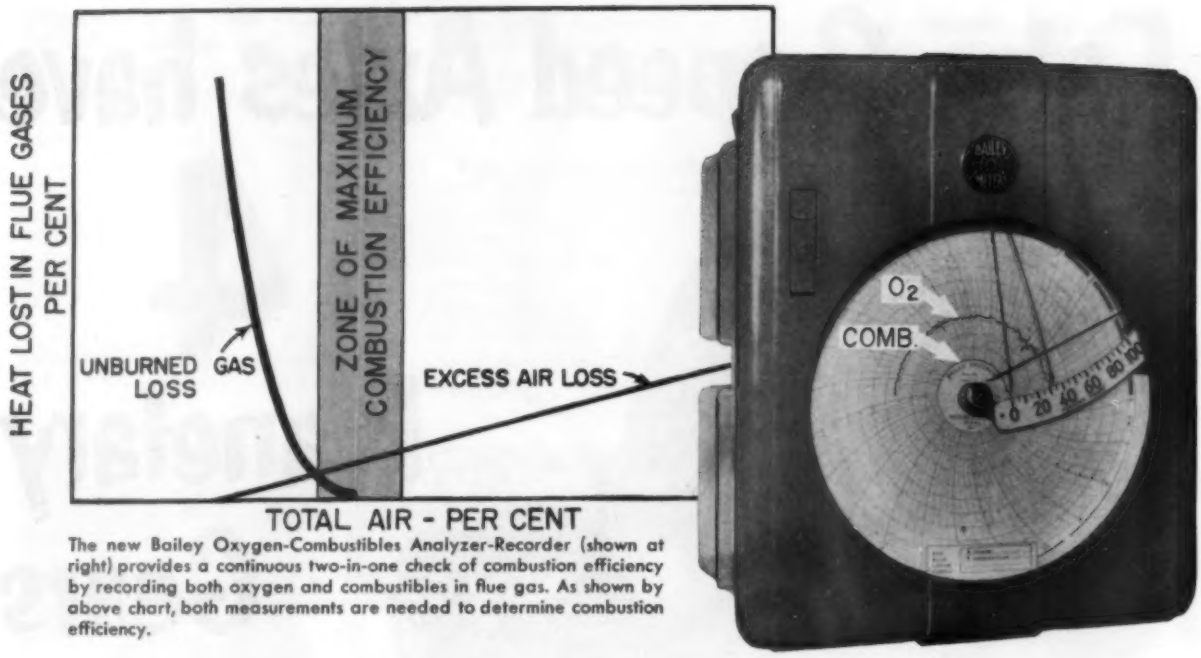
PRODUCTS: Sodium Cooled, Poppet, and Free Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Rotor Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Heater Defroster Units • Snap Rings Springtites • Spring Washers • Cold Drawn Steel • Stampings • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers



The new Bailey Oxygen-Combustibles Analyzer-Recorder (shown at right) provides a continuous two-in-one check of combustion efficiency by recording both oxygen and combustibles in flue gas. As shown by above chart, both measurements are needed to determine combustion efficiency.

BAILEY announces • • •
New 2 in 1 way to measure Combustion Efficiency

The new Bailey Oxygen-Combustibles Analyzer-Recorder gives you a continuing double check on combustion economy. It's fast response measures and records:

1. Excess air—regardless of the fuel or combinations of fuels being burned.

2. The mixing efficiency of your fuel-burning equipment—by indicating the amount of combustibles in your flue gas, resulting from incomplete mixing of fuel and air.

Combustion efficiency depends upon fuel-air ratio. Too much fuel can be even more costly than too much air. And because of the interdependence of these two factors, no control that measures only one of them can give you complete protection.

Now, for the first time, you can check *both* with a *single* fast acting instrument, using the new Bailey Oxygen-Combustibles Analyzer-Recorder for industrial furnaces, kilns, heaters and boilers.

Fuel economy improves as excess air is reduced —until unburned fuel begins to show up in the flue gas. When this happens, combustion efficiency drops off sharply if there are further decreases in the air-fuel ratio. That's why combustion gases must be analyzed for *both* oxygen and combustibles to get a true indication of efficiency—and that is why Bailey coordinates both measurements on the same chart, to show when excess air may be reduced safely without danger of greater losses from unburned gases.

The Bailey Oxygen-Combustibles Analyzer is an approved combustion safeguard.

Ask your local Bailey engineer for suggestions on application. Equipment details in Product Specifications E65-1 and E12-5. P31-1

BAILEY METER COMPANY

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For Power And Process

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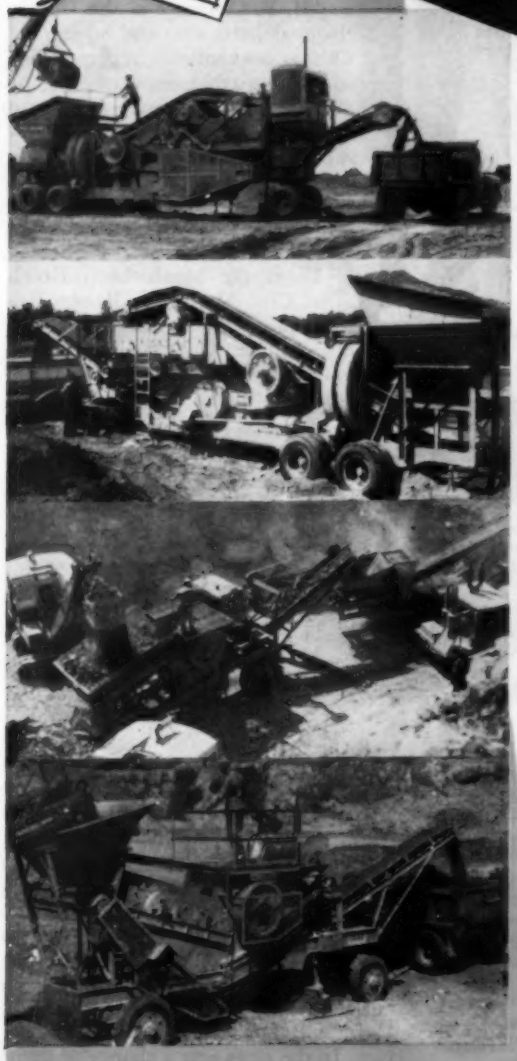
PROFIT INSURANCE FOR 1955...

CEDARAPIDS
Big Capacity Low Maintenance Aggregate Plants



CEDARAPIDS COMMANDER PLANTS

Big production is the reason this plant has proved to be the most popular Cedarapids plant ever built. The big Roll Crusher provides the high secondary crushing capacity to turn out desired fine-crushed products. Large screening capacity of the Horizontal Vibrating Screen balances crusher production. Conveyors are 30″ wide to handle the increased capacity of the plant.

CEDARAPIDS SUPER TANDEM PLANTS

The big 48″ x 12′ Horizontal Vibrating Screen gives you the extra screening capacity that assures highly profitable operation in pits with high percentages of fines or contaminated material. It's a money-maker in *any* pit! Output over 240 tons per hour of −1″ material with 20% crushing has been reported.

CEDARAPIDS PRIMARY PLANTS

Use a Portable Primary ahead of your gravel plant to turn either pit or quarry jobs into highly profitable operations. The complete Cedarapids line includes Jaw Crusher Primaries in sizes from 1524 to 3240; an 1836 Twin Jaw Crusher Primary; two sizes of Portable Double Impeller Impact Breakers; plus production boosting Vibrating Grizzlies and Scalping Screens.

CEDARAPIDS SINGLE PASS PLANTS

The most practical, economical Single Pass plant on the market for making good money on road maintenance, small contracts, base or blanket course jobs, and many others. Hopper and feeder are mounted on rear end to let you *back up* to the nearest gravel bank and start producing two sizes of material immediately. Money saved on shorter hauls and low maintenance soon pays for the plant.

Write for Literature

Cedarapids — Built by IOWA

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa, U. S. A.

Double Impeller Impact Breakers

Hammermill Secondary Plants

Model CM Bituminous Mixing Plants

Model G60 Bituminous Mixing Plants

30 years ago in Pit and Quarry

By WALTER E. TRAUFFER

THE January 1 and 15, 1925, issues of PIT AND QUARRY featured programs and reports of several conventions. The ninth annual convention of the National Sand and Gravel Associations, held at the Auditorium Hotel in Chicago January 5 to 7, consisted essentially of four technical sessions and a dinner. On the program were such men as: Frank W. Renwick (Chicago Gravel Co.); President John Prince (Stewart Sand Co.); J. L. Shiely (J. L. Shiely Co.); Alex W. Dann (Keystone Sand & Supply Co.); Lawrence L. Rogers (Union Rock Co.); T. E. McGrath (McGrath Sand & Gravel Co.); W. E. Rogers (Arkansas River Sand Co.); and A. P. Burke (Atlanta Sand & Supply Co.)

The National Crushed Stone Association held its ninth annual convention January 12 to 15 in Cincinnati, Ohio. On the program were: President John J. Sloan, George E. Schaffer, J. F. Schroeder, George Balfe, John Rice, and A. P. Chamberlin.

The American Road Builders Association met January 6 to 8 at the Congress Hotel in Chicago with a machinery show at the Coliseum. On this program were: Thomas H. MacDonald, chief of the Bureau of Public Roads; Frank T. Sheets, chief engineer, Illinois Division of Highways; H. F. Clemmer of the Illinois highway department; and others.

Other conventions reported included the sixth annual meeting of the Wisconsin Mineral Aggregate Association at the Pfister Hotel, Milwaukee. J. K. Jensen of the Janesville Sand & Gravel Co. was elected president. The sixth annual meeting of the Missouri Valley Sand and Gravel Producers was held on December 16 and 17 at the Muehlebach Hotel, Kansas City, Mo. W. E. Rogers was elected president and R. J. Stewart, vice-president. The Illinois Gravel & Sand Association met on December 29, 1924, at Galesburg, Ill.

There was a wide selection of plant operating articles in these two issues. Sand and gravel operations included the new fifth plant of the Terre Haute Gravel Co., Terre Haute, Ind.; the new plant of the Central Sand & Gravel Co., Memphis, Tenn.; the J. C. Stewart Co., Owasso, Mich.; the Easton Kaster Gravel Co., Indianapolis, Ind.; and Thogmartin and Gardiner, Iola, Kans.

Crushed stone plants included that of the City of Winnipeg, Canada, and Southern Illinois Limestone Company, near Golconda, Ill., also the crushed marble plant of Donald U. Smith at Ashby Falls, Mass. Other plants included the terrazzo plant of the Brandon Rock Products Corporation at Brandon, Vt.; the rock asphalt plant of the Crown Rock Asphalt Company near Big Clifty, Ky.; the nonmetallic custom grinding plant of Mineral Products, Inc., at Los Angeles, Calif.

In the news was a change of name for the Pawling & Harnischfeger Company, Milwaukee, to the Harnischfeger Corporation in honor of Henry Harnischfeger, who 40 years before had entered into partnership with Alonzo Pawling. This leading manufacturing firm started out in a 26- by 50-ft. one-story shop building. Incorporations listed were for the Yosemite Portland Cement Corp. and the Ideal Cement Co.

PACK and SHIP in

QUALITY MULTIWALLS

by CHASE BAG COMPANY

CHASE makes sure you get the right bag for your needs. All types and sizes available.

The CHASE reputation for quality is justly earned—108 years of experience.

You avoid costly delays when you deal with CHASE. Fast service from convenient shipping points assures "on time" delivery.

Place your next order with CHASE!

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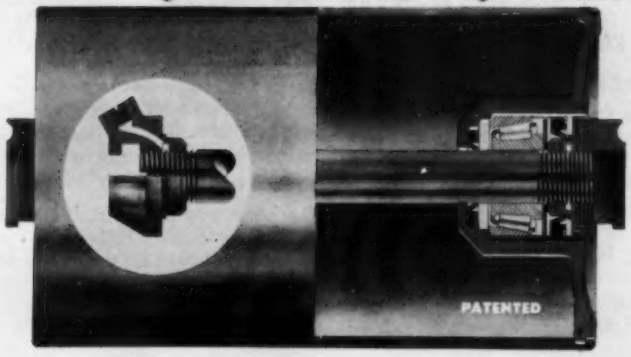
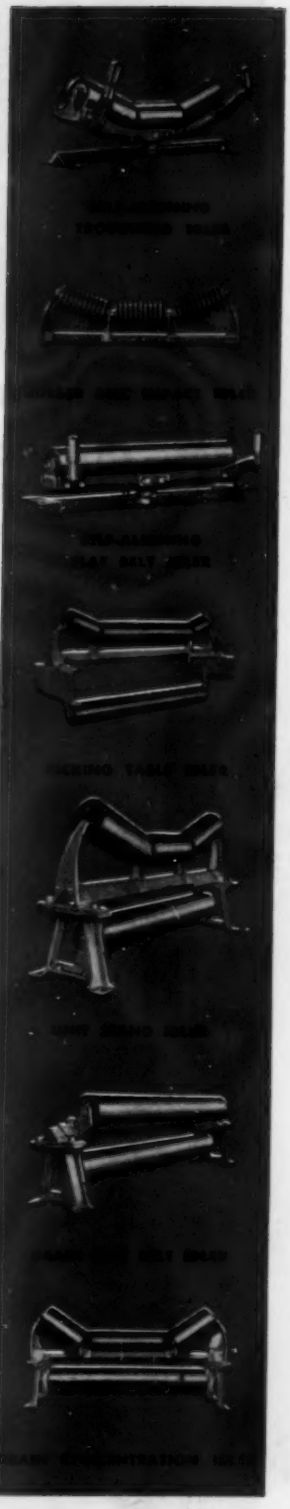
General Sales Offices, 309 W. Jackson Blvd., Chicago 6

You Need... CONTINENTAL'S UST Idlers

CGC UNIT-SEALED CGC PRE-LUBRICATED CGC TIMKEN BEARINGS





Saves Grease!
Saves Labor!
Saves Belts!
Long Life - **THE ULTIMATE IN MINIMUM MAINTENANCE**

Continental's Unit-Sealed "UST" Conveyor Idlers, incorporating Timken Bearings, Garlock Klozures, are the answer to the operator's prayer.

The Unit Bearing Assemblies—"sealed unto themselves" provide an ample but not excessive grease reservoir. This represents a saving of grease and further eliminates any possible migration of the grease from upper to lower bearings on inclined rolls. The lubricant is a top quality water repellant grease of a stable consistency with a wide temperature range for long life.

Most important—this construction permits operating the Continental "UST" Idler for extended periods of time without relubrication for 1-2-3 years or longer depending upon the severity or character of conditions.

For detailed information on these idlers write for Bulletin PQ-116

INDUSTRIAL DIVISION
CONTINENTAL GIN COMPANY
BIRMINGHAM, ALABAMA

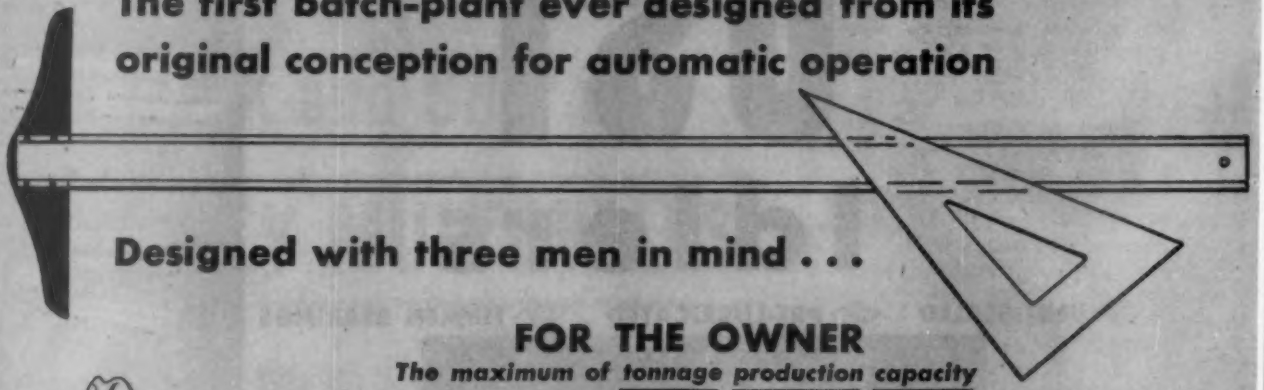
ENGINEERS — CGC ATLANTA • DALLAS • MEMPHIS • KNOXVILLE CGC — MANUFACTURERS

NEW YORK CITY

introducing the

Barber-Greene

The first batch-plant ever designed from its original conception for automatic operation



Designed with three men in mind . . .

FOR THE OWNER

The maximum of tonnage production capacity

ALL SIZES OF AGGREGATE, INCLUDING THE MINERAL FILLER, ARE WEIGHED SIMULTANEOUSLY. Total weighing time for all ingredients is considerably less than the shortest mixing time in any specification. The only limit on hourly production is the specified mixing time. The completely new pugmill principle gives *thorough coating in less time than any other pugmill manufactured today.* When a minimum mixing time is *not* specified, complete coating can be obtained and the tonnage output increased to far above the production of plants of comparable pugmill capacity. Virtually no time lost in discharging. Full-opening bottom gives instantaneous discharge without segregation.

The maximum of flexibility

The plant may be "preset" for all-day production of the same mix in repetitive cycles, and *instantly* switched for a new mix for the "drive-in" customer. *Sooner than the next truck can drive under,* the plant is back to its preset proportions and in repetitive cycle operation again.

FOR THE OPERATOR

A new ease and simplicity of operation

***Automatic Operation.* With the proportions preset, the operator locks in the "cycle" button when a truck drives under. The plant then automatically goes through complete cycles, *including discharging to the truck.* If he merely pushes the automatic button (without locking it), the plant goes through the complete cycle up to the point of discharging.**

***Manual Operation.* For individual loads or other "drive-in" trade, the operator instantly disengages the preset combinations and weighs out each size of aggregate in ordinary batch-plant fashion. Operating one valve resets the preset proportions.**

Using preset proportions, the operator can manually weigh the materials by either operating one valve to *WEIGH ALL SIZES SIMULTANEOUSLY,* or operating the individual bin valves to weigh each size separately. In either of these cases, *no skill or judgment is required for accuracy.* The preset combinations control the proper weight.

FOR THE INSPECTOR

At any time, the inspector can quickly check the *weight* of the *asphalt,* the *weight* of *each size of aggregate,* the *weight* of the *mineral filler,* or the *weight* of the *total aggregate.*

The plant *automatically extracts a true cross-sectional sample* of the aggregate in each bin as part of its regular operating cycle. Normally this sample is fed into the next batch, but at any time the inspector can remove this sample for a gradation check. The plant can be set so that the cycle will be interrupted if there is any variation from the preset proportions.

BITUMINOUS
Batch Plant
890 series

Here is the most revolutionary development in the field of bituminous paving since Barber-Greene introduced the continuous plant over a quarter century ago.

When continuous type? When batch type?

The superior performance of the new Barber-Greene Batch-Plant is *not* reason for switching to batch-plants in applications where a continuous-type plant will serve.

No batch-plant, not even the new Barber-Greene, can compete with the continuous plant for highway work, or any application where high tonnage production and portability are important factors.

The basic advantages of the continuous principle continue to exist, and the continuous plant should and will continue to be the most popular.

However, where the batch principle is preferred, primarily for the purpose of serving frequent "drive-in" trade, requiring different mixes during the day, Barber-Greene now offers the outstanding batch-plant of the field.

For years, Barber-Greene has produced more asphalt plants than all others combined. We continue to offer the most comprehensive line of bituminous equipment of any manufacturer.

Automatic Controls

The electric controls are simple 110-volt A.C. circuits. There are *no* electronic devices. The automatic measuring itself is *not* dependent on the electrical controls. If for any reason the operator wishes or needs to operate without the electrical controls, he may do so, and no skill or judgment is required.

55-1-WB

Barber-Greene
AURORA, ILLINOIS, U.S.A.

WRITE for INFORMATION

descriptive literature . . . sound movies

cost studies . . . nearby job inspection . . . plant layouts

Elthon, Aglime Producer, Becomes Governor of Iowa After Death of Beardsley

Upon the tragic death of Governor William S. Beardsley of Iowa in an automobile accident on November 21, 1954, Lieutenant Governor Leo Elthon, a limestone producer of Fertile, Iowa became the 32nd governor of the state. He will hold this office until January 13, 1955, when the governor-elect will be sworn into office; at this time he will resume his duties as lieutenant governor.

With the assumption of these duties Mr. Elthon became the first member of the agricultural limestone industry to hold such a high public office. Because of his political activities it has been necessary for him to turn over his managerial duties with the Limestone Products Company to his business partner, Norman Jorgensen. The limestone quarry is located on a 280-acre farm, and that part of it not occupied by the quarry is being systematically farmed with proper crop rotation, with the use of agstone, etc. As a result it has become a very profitable operation.

Mr. Elthon attended Fertile High School and Augsburg Seminary, then Iowa State Teachers College and a commercial college. Upon graduation he taught manual training and athletics in the schools at Clear Lake, finally serving as principal at Fertile High School. Later he became a farmer, but was caught in the economic collapse after the World War I boom which left him several thousands of dollars in debt. With typical honesty and courage he managed through much effort (including chopping wood) to pay off every one of his debts.

Leo Elthon, interim governor of Iowa

In the spring of 1932 Mr. Elthon decided to run on the Republican ticket for the state senate, and despite a Democratic landslide in the state he was successful in his bid. This was the beginning of a long and fruitful career in his state senate which continued uninterruptedly until 1952, when he retired to become Republican candidate for lieutenant governor. Again he was successful, and in 1954 he was returned to that office with the highest total vote for any state office.

During his service as a state senator Mr. Elthon was especially active on conservation committees and projects which stimulated his interest in agricultural limestone as a means of insuring the continued fertility of our country's soil.

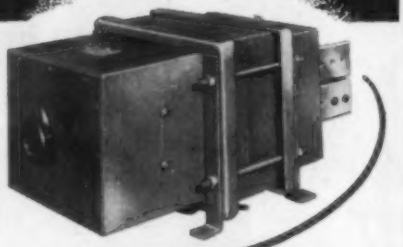
His farming venture, on which he once failed, has now prospered through his increased knowledge of crop rotation and scientific limestone application.

In retrospect, we see Leo Elthon as a leader in politics and government, farming, education, and business who stands as one more example of a nonmetallic mineral producer who is an active and constructive force in his community and state.

LET THE RECORDS SPEAK!

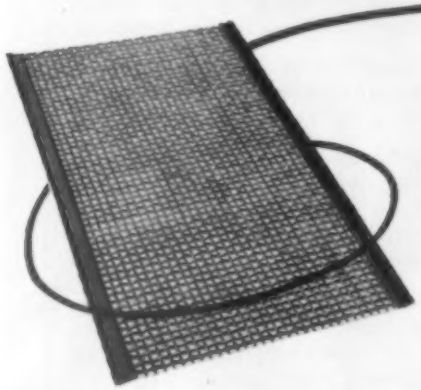
HANCO SCREEN HEATERS

ELIMINATE *Costly* SCREEN BLINDNESS



FASTER, MORE ACCURATE SIZING

HANCO electric heaters are engineered to meet top capacity requirements for heating all metallic screen cloth. Mechanical abuse such as "beating" or brushing can be **eliminated completely** when you install a HANCO electric heater. Treat your screens the modern way—get HANCO.



Available in five different assemblies. HANCO engineers have designed and constructed electrical screen heaters to fit YOUR make of screen. Note: Reduction in openings can be effected to meet ever changing specifications.

LOOK AT THESE FEATURES

Faster screening—faster processing means fewer "returns".

Elimination of mechanical abuse to keep screens open.

Longer screen life — no manual cleaning increases screen life up to 800%.

Fewer shut downs for replacement of worn screens.

HANCO quick change assemblies assure easy cloth changes.

Low maintenance cost. HANCO heaters are designed for heavy-duty service.

SEND FOR OUR COMPLETE BULLETIN

Hanco

F. R. HANNON & SONS

1605 Waynesburg Rd. S.E., Canton 7, Ohio

PIONEERS IN ELECTRIC SCREEN HEATING — FIRST IN THE FIELD OF LOW VOLTAGE AND HIGH AMPERAGE SCREEN HEATING

"WE BOUGHT OUR *Second** ORTON CRANE BECAUSE . . .

"The ORTON crane delivers more actual hours 'on-the-job' work than any crane we've ever owned!"

(One reason is that an ORTON is so easily maintained. With all its modern developments, ORTON cranes have not sacrificed easy access to working parts.)

Don't overlook that an ORTON not only delivers more working hours, but, Air-operation and

Torque-Control

makes operating hours *less fatiguing* to man *and* machine! The *efficiency* of patented power-through-liquid Torque-Control *is unapproachable by even the most complicated mechanical or electrical systems.* Torque multiplication is *always* and *instantly* at the *exact* load requirement.

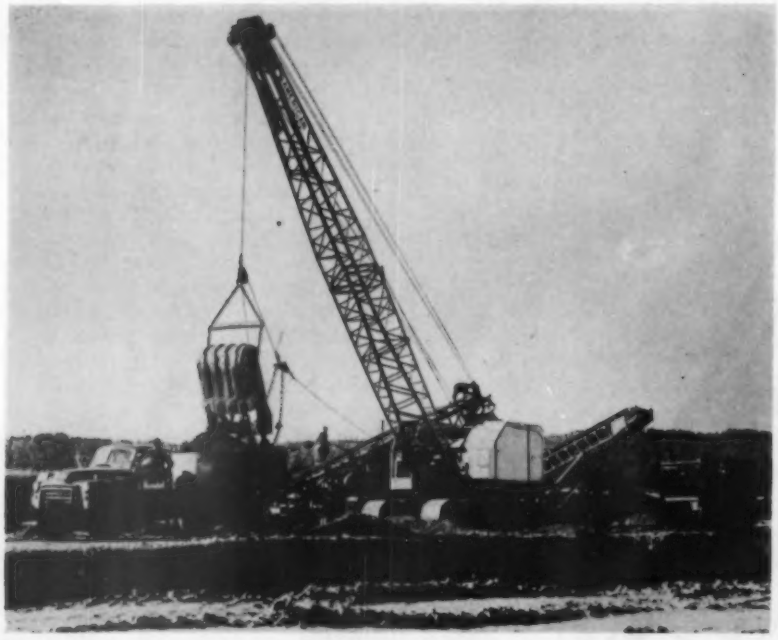
ORTON

CRANE AND SHOVEL CO.

608 S. DEARBORN ST., CHICAGO 5, ILLINOIS

Send For Catalog No. 84

* Send for a list of ORTON purchasers who have bought three or more cranes since the application of Torque-Control. We want you to base your decision on the testimony of ORTON owners.



● An American 700 Series crane is being operated by Apex Building Supplies, Ltd., Edmonton, Alberta, Canada, for loading out pit-run gravel at the rate of 3,000 tons per 10-hour day on two 10-mile haul contracts. The crane is equipped with long tracks and a 50-ft. boom carrying a Page 60-cu. ft. bucket. Fifty trucks are used on the two hauls. Stripping of overburden is done with a Caterpillar D-8 tractor and a LeTourneau model F scraper, crushing with a Pioneer 48V portable crushing plant, dozing with the D-8 and dozer, and weighing with a Thurman portable truck scale. An Allis-Chalmers HD7 tractor with overhead loader, is also used for loading. The property being worked is the old river bottom of the N. Saskatchewan River, northeast of Edmonton.

Expanded Shale Producer Installs 160-Ft. Kiln at Plant

Delivery of a 160-ft., 170,000-lb. kiln to be used by the newly-formed Minnesota Light-Weight Aggregate Company, St. Paul, Minn., makes that company owner of one of the largest kilns in the industry to be used for the production of expanded shale. Associated with the Twin City Brick Company of the same city, the new concern plans to go into production with a daily output of approximately 250 cu. yd.

Organizers of the new company are C. H. Klein, M. C. Madsen, and L. V. Madsen. Mr. Klein will be president of the new firm. Raw material for the aggregate will be the Decorah shale which is available in the vicinity. The firm will not produce building blocks.

Ferre Industries Obtains Controlling Stock in Maule

Sale of controlling interest in Maule Industries, Inc., to Ferre Industries of Puerto Rico for $4,500,000 has been announced by J. H. Buchanan, Maule president. The foreign concern exercised its option to purchase 700,000 shares of common stock at $5 per share from Chemical Research Corporation which, coupled with 200,000 shares the firm already owns gives it a majority stock interest.

J. Bradley Streit, board chairman, said Chemical Research had sold its controlling interest in Maule in order to diversify its investments.

● Quarry scene at the facilities of the M. J. Grove Lime Company, Frederick, Md., showing a 6,500-lb. cast semi-steel drop ball in action. Grove officials estimate that the ball, a product of Frederick Iron and Steel, Inc., has made 112,000 drops on hard limestone in a 7-month period — from December, 1953, and July, 1954 — or an average of four per minute. During these months the skull crusher lost 2,100 lb.; but it is still usable despite this punishment. The ball is dropped from a 30-ft. height on rocks weighing from 300 to 3,000 lb.

Lehigh Portland Cement Plans $15,000,000 Expansion At Union Bridge Plant

Plans for a $15,000,00 expansion project at the Union Bridge, Md., plant of the Lehigh Portland Cement Company were announced recently by Joseph S. Young, president.

"When construction is completed late in 1956," Mr. Young stated, "this plant will produce more than 3,000,000 barrels of cement annually."

Mr. Young added that the increased production will end the chronic cement shortage in Baltimore and Washington markets, thus assuring buyers in these areas of adequate quantities of all types of cement from Union Bridge, their nearest source of supply.

The expansion program, Mr. Young explained, will be expedited without interference with current output. Upon completion, the Union Bridge plant will be one of the largest in the company's chain.

This is the seventh major project in Lehigh's post-war expansion program. Since 1948 capacity has been increased at plants in Metaline Falls, Wash., Fordwick, Va., Mason City, Iowa, and Alsen, N. Y. Capacity of a new plant built at Bunnell, Fla., in 1952 now is being almost doubled.

"By December, 1956," Mr. Young said, 'Lehigh's total capacity will be 26.500,000 barrels, an increase of 7,200.000 barrels since the close of World War II."

W. F. Miller Fatally Injured In Aiding Trapped Employee

Caught in a collapsing slag pile, William F. Miller, general manager of the Lorain (Ohio) Slag Company, was crushed to death while trying to rescue a trapped employee.

Mr. Miller had tried to save Henry Kraemer, who was seriously injured. During loading operations the slag had become caked over the 15-ft. pit opening of a conveyor system leading to a freighter. When Mr. Kraemer stepped on the piled-up slag, it collapsed and he was carried down into the opening. Mr. Miller rushed to his rescue, but dropped from sight. Workmen pulled out both men, but found that Mr. Miller had been fatally injured.

Col. Henry Crown, chairman of the board of Material Service Corporation, who was the subject of the August PIT AND QUARRY "Men of Industry" story, recently finished negotiations which gave him 100 percent ownership of the Empire State building in New York City.

TYPE F
STEELFLEX
COUPLING

- Any Size
- Any Service
- Any Application, Horizontal or Vertical
- Always available

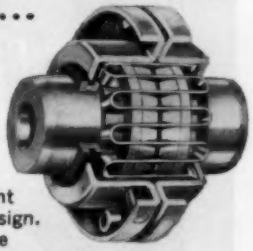
The exclusive grid-groove design of FALK Steelflex Couplings protects your machinery in two ways

You get double protection when you connect your driving and driven machinery with a Falk Steelflex Coupling—the all-steel-built coupling with the exclusive grid-groove design! First, its torsional resilience smothers shock and vibration; and second, the Steelflex design prevents damage and lowered efficiency by accommodating shaft misalignment.

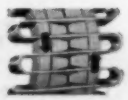
Why have increasing numbers of key men in industry standardized on Falk Steelflex Couplings? Their experience has proved that Falk Steelflex Couplings prolong the service life of their machinery...are trouble-free and need minimum maintenance...are easy to install, lubricate and disconnect ...and cost less per year of service than ordinary couplings.

One basic Steelflex design—the Type F, in its many sizes—is adaptable to more than 90% of all industrial applications. This facilitates buying, as well as prompt replacing and servicing when necessary. Write to Department 247 for engineering bulletin, including selection and dimension details.

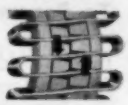
How shock and vibration are smothered by the FALK Steelflex Coupling's Torsional Resilience...



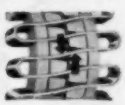
This cutaway view shows the sturdy all-steel construction, also the exclusive, torsionally resilient grid-groove design. Here is how the grid-groove design functions:



UNDER LIGHT LOADS The gridmember bears only at outer edges of grooves. The long span between points of contact remains free to flex under load variations.



UNDER NORMAL LOADS As load increases, the distance between supports on grooves is shortened proportionately, but a free span remains to cushion shock loads.



UNDER SHOCK LOADS Under extreme overloads, the gridmember bears fully on the grooves and transmits full load directly. The coupling remains flexible, within its rated capacity.

SHAFT MISALIGNMENT ACCOMMODATED
Free End Float Permitted

Controlled flexibility in the FALK Steelflex coupling provides compensation for parallel and angular shaft misalignment—and permits free end float for the shafts of the driving and driven members, or of either one.

PARALLEL MISALIGNMENT

ANGULAR MISALIGNMENT

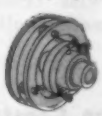
FREE END FLOAT

Rapid CM—Reversing Service

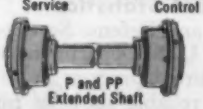
H and HH High Speeds

FS—Limited Space

BW—Brakewheel Service



FT—Overload Control



P and PP Extended Shaft

OTHER TYPES AVAILABLE

In addition to the standard Type F (which meets more than 90% of all applications), special or dual purpose Steelflex designs are available for unusual applications. A few of the many types are shown here.

THE FALK CORPORATION, Milwaukee 8, Wisconsin

MANUFACTURERS OF

- Motoreducers
- Speed Reducers
- Flexible Couplings
- Shaft Mounted Drives
- High Speed Drives
- Special Gear Drives
- Single Helical Gears
- Herringbone Gears
- Marine Drives
- Steel Castings
- Weldments
- Contract Machining

FALK

...a good name in industry

● The 1,000-ft. rail spur which will serve a 9-acre "freezer" being constructed in a worked-out area of the Thompson-Strauss Quarries near Kansas City, Mo.

Limestone Quarry "Cellar" To Become Outsize Freezer

Not far from Kansas City, Mo., the "world's largest" underground freezer (covering about 9 acres) is nearing completion in the worked-out section of a limestone mine which has been operated since 1911. Leonard H. Strauss, 36-year-old president of the Inland Cold Storage Company, bought the quarry in 1941; and as the Thompson-Strauss Quarries, it will continue to produce limestone.

A spur line of the Santa Fe Railroad will extend 1,000 ft. into the cave. Eight refrigerated storage rooms will open from either side of the tracks. Total capacity of the chambers will be 3,000,000 cu. ft.—enough for 2,500 carloads of frozen foods.

The cave is designed principally as a freezer, rather than for cold storage at normal underground temperatures. Most of the rooms will be maintained at a temperature of -10 deg. F., only about 10 percent at 38 deg. F.

Partition walls between the rooms will be lined with 5 in. of Pittsburgh Corning Foamglas cellular insulation, and perimeter walls will have a double layer.

Conference on Construction Aims at Correct Statistics

The Business and Defense Services Administration, U. S. Department of Commerce, reported progress in developing more reliable statistics for the construction industries during the recent Building Materials and Construction Industries Conference.

Industry spokesmen declared, however, that it is vital to future activities in the construction field to obtain more detailed and accurate information as a means of stabilization and preventing overbuilding in some areas. It was pointed out that only the government can collect the kind of information needed by the construction industries.

One project planned at the meeting is a survey to measure the volume of all kinds of materials used in construction, for which data and figures are very vague.

U.S. Lime Sales in August, 1954 Show 1 Percent Increase

In August, 1954, domestic sales of open-market lime (632,256 short tons) increased one percent over the previous month, according to reports by producers to the U. S. Bureau of Mines. Agricultural, chemical, and other industrial uses increased over the previous month, whereas decreases were noted for building and refractory uses. The table shows sales by types and major uses.

Gen'l Portland Cement Co. Plans Extensive Expansion At Dallas, Houston Plants

General Portland Cement Company is again expanding its Dallas plant by adding a new 425-ft. kiln, additional grinding equipment, and other facilities to increase output by 1,250,000 bbl. annually. It is expected that production will begin about July 1, 1955. The Dallas plant was built in 1951.

A similar expansion will be effected in the company's Houston plant when construction is completed there. The new Houston equipment is expected to begin producing cement this month.

Consolidated Cement to Add 1,300,000 Bbl. Yearly in 1955

It has been announced by the officials of the Consolidated Cement Corporation, Chicago, Ill., that a major rehabilitation and expansion program will be undertaken at the firm's Fredonia, Kans., plant.

Contracts have been awarded for equipment to increase the plant's annual capacity by 1,300,000 bbl., and work will begin early this year. Upon completion of the proposed work the capacity of this facility will be 2,300,000 bbl. annually. New equipment will include a 425-ft. kiln and additional grinding machinery.

It is anticipated that production from the additional equipment will become available to Kansas users about September 1, 1955. Consolidated operates a second cement plant at Cement City, Mich.

Lime Sold by Producers[1] in the United States, in Specified Periods of 1953-54, by Types and Major Uses, in Short Tons

	July	August		January-August	
	1954	1954	1953	1953	1954
By types:					
Quicklime	458,690	469,097	565,959	4,454,338	3,642,548
Hydrated lime	158,089	163,159	163,236	1,266,115	1,253,665
Total lime[2]	616,779	632,256	729,195	5,720,453	4,896,213
By uses:					
Agricultural:					
Quicklime	2,361	8,347	7,852	41,954	50,545
Hydrated lime	9,268	14,511	14,665	141,309	141,997
Total	11,629	22,858	22,517	183,263	192,542
Building:					
Quicklime	17,089	16,294	16,247	128,527	127,342
Hydrated lime	91,564	90,242	85,199	620,462	642,255
Total	108,653	106,536	101,446	748,989	769,597
Chemical and other industrial:					
Quicklime	301,833	307,198	338,899	2,704,557	2,322,861
Hydrated lime	57,257	58,406	63,372	504,344	469,413
Total	359,090	365,599	402,271	3,208,901	2,792,274
Refractory (dead-burned dolomite)	137,407	137,263	202,961	1,579,300	1,141,800

[1]Also includes a small quantity of captive tonnage (6-7 percent of the total reported herein) to maintain comparability with the annual lime statistics. The monthly canvass excludes the output of plants producing less than 10,000 tons a year.

[2]Approximately 60 percent of lime produced is high calcium and 40 percent high magnesium.

Turning sacks into salesmen!

RAYMOND does it daily for scores of multiwall paper shipping sack users. How? With the aid of "Kolorseal"—a method of quick-drying printed colors, equipment for which was designed and built by Raymond engineers.

The advantages—brighter, more permanent colors; little or no color loss due to offset; cleaner, sharper appearance of both trademark and copy. Raymond, through the "Kolorseal" method, can improve the appearance of your brands by as much as 20% or more at no extra cost to you.

Worth investigating? Call in the Raymond man, now. He will show you comparative "run of the press" samples offering visual proof of "Kolorseal" and its ability to turn sacks into salesmen.

THE RAYMOND BAG COMPANY,
Middletown, Ohio. Phone 2-5461.

Raymond
MULTIWALL PAPER SHIPPING SACKS

Lone Star Cement Corp. Reveals Two-Year Program For $14,200,000 Expansion

A $14,200,000 program for remodeling and enlarging Lone Star cement plants at Greencastle, Ind., Nazareth, Pa., and Bonner Springs, Kans., was recently announced by H. A. Sawyer, president of the concern, who revealed that this would be Lone Star's largest expansion program since the construction of the new plants at Lone Star, Va., Maryneal, Tex., and Aratu, Brazil.

The new expansion program, which is already under way, will result in increasing the annual productive capacity of the Lone Star system within the next two years by 1,660,000 bbl., giving a total of 35,660,000 bbl. for the 18 plants owned by the firm.

It was indicated that the work at the plants which will include adding kilns, a coal mill, new storage and loading facilities, and other equipment, will be handled in stages to avoid halting production. No outside financing will be necessary to carry out the program.

According to Mr. Sawyer, Lone Star has increased its production capacity by 42.6 percent, or a total of 10,660,000 bbl., since the end of World War II. He stated that during the last decade total expenditures for construction and improvements (excluding the new Aratu plant) will have amounted to approximately $85,000,000.

Chicago Aggregates Firm Speeds Israel Dam Project

Construction Aggregates Corporation, Chicago, in a joint venture with the National Engineering Company, Ltd., of Israel, has started construction on an extensive dam project near Sedom on the Dead Sea. The project consists of a series of 5-ft. high dams extending for a distance of 23 miles to provide a water supply for washing salt pans at the potash factory.

Resumption of potash production at the Sedom plant will require a new intake canal for salt water supply, new salt drying pans, and enlargement of existing pans for raw unfinished potash.

E.N.C.I., Maastricht, Netherlands, the first cement firm in that country, has begun construction of a new cement kiln which will increase production to 950,000 tons per year. Three other kilns will be built later.

3 More Lime Operations Receive Safety Awards—Join 1,000 Day Safety Club

Awards presented at a special ceremony in Milwaukee, Wis., to the Ash Grove Lime & Portland Cement Company's Springfield, Mo., plant and the National Gypsum Company's Luckey, Ohio, operation made these companies the newest members of the 1,000 Day Safety Club for the Lime Industry. The Ash Grove plant chalked up 1,683 days without a lost-time injury, and National Gypsum recorded 1,537. Certificates of Achievement in Safety were presented by the National Lime Association to K. V. White, superintendent of the Springfield plant, and R. E. Gill, production manager at Luckey. This event took place during the N.L.A. operating meeting.

On December 2 a third 1,000-Day Safety certificate was awarded to the Knoxville, Tenn., plant of the Standard Lime and Stone Company. Lewis Rumford, executive vice-president of the firm, accepted the award for the employees, who had worked a total of 1,592 days without a disabling injury.

The 1,000 Day Safety Club for the lime industry is open to all commercial lime plants enrolled in the industry-wide safety competition sponsored annually by the National Lime Association. This contest is conducted in co-operation with the U.S. Bureau of Mines.

Another Job Done Better With The ALL-NEW 'Jeep'®

"GO-ANYWHERE" TRANSPORTATION

Here's the vehicle that takes men and tools to the job when nothing else can—the all-new 4-Wheel-Drive 'Jeep'. With the extra traction of its 4-wheel-drive, the 'Jeep' goes through mud, sand, snow and roadless country . . . saves time when time counts most. It is good business to own the all-new 'Jeep' . . . and good insurance of getting through to the job every day in the year. Get all the facts about the all-new 'Jeep'.

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THE WORLD'S MOST USEFUL VEHICLES

● In almost every corner of the earth the Red Cross is recognized as a symbol of the good neighbor. It may represent you, through your membership, in helping other people in time of trouble. Or it may represent warm-hearted people whom you do not know, rallying to your aid in an emergency. It works both ways. When the Red Cross answers the call of those in need—in emergencies or in every day situations—Americans keep alive one of our great traditions, that of friendly, neighborly help to our fellowmen. Do your part to carry on that tradition.

Yeager Sees Boom Year For Gypsum in 1955 To Meet Building Needs

According to Lloyd H. Yeager, general manager of the Gypsum Association, the gypsum industry will enjoy another boom year in 1955, with the demand for its products rising to an all-time high. He predicted that the government's estimate of a $39,500,000,000 high in construction outlays in 1955 augurs well for the gypsum trade, since this material is used in nearly every type of building.

Describing the year just past as one of healthy growth for the gypsum industry, Mr. Yeager stated that the total volume of gypsum rock mined in 1954 will probably reach 11,500,000 tons, up 300,000 tons from 1953; it would be the second-highest total in history. He added that gypsum manufacturers are gearing 1955 production to supply the needs of approximately 1,000,000 home starts. In the commercial building field industry leaders expect business to equal or exceed 1954's estimated $2,100,000,000.

N.Y. Aggregates Safety Group Names H. H. Kirwin President

At a recent meeting of the Eastern New York Mineral Aggregates Safety Council at the Ten Eyck Hotel, Albany, N.Y. new officers for 1955 were elected.

H. H. Kirwin, Eastern Rock Products, is president; David E. Stevens Jr., Lone Star Cement Corporation, vice-president; Edward G. Sullivan, New York Trap Rock Corporation, secretary; and Norman Aurand, Universal Atlas Cement Company, treasurer.

November, 1954, Construction Sets New Record for Month

New construction activity declined seasonally in November, but the $3,300,000,000 total of work put in place set a new record for the month and was 8 percent above the total of November, 1953, according to preliminary estimates prepared jointly by the U. S. Departments of Commerce and Labor. On a seasonally adjusted basis, outlays for new construction were at an annual rate of $38,100,000,000, the highest level ever reached.

Expenditures for privately financed construction were at a new November high of $2,300,000,000, with new home construction maintained at an unprecedented rate for this time of year and nonresidential building volume matching the peak monthly activity achieved in the third quarter.

Private residential building activity, at $1,300,000,000, was the largest November total ever recorded, and nearly one-forth more than similar outlays in the same month of last year.

Total public outlays, $900,000,000, were about the same as in November, 1953. All major classes of public construction declined seasonally, although the rate of decline generally was more moderate than the usual downturn from October to November.

During the first 11 months of 1954 new construction outlays amounted to $34,100,000,000—5 percent more than in the same 1953 period. Total private work was up 7 percent over January-November, 1953, to $23,400,000,000, with residential, commercial, religious, and educational building setting new records for the period.

Continued increases to new record levels for all important classes of state and local government construction have been virtually offset by a reduced volume of direct federal construction and public housing, so that total public construction expenditures in 1954 through November were about the same as in the corresponding months of a year ago, $10,600,000,000.

Marquette Plans Expansion, Conversion at Two Plants At Cost of $1,300,435

Directors of the Marquette Cement Manufacturing Company are reported to have authorized an expenditure of $1,300,435 for an expansion program.

The proposed project includes additions and improvements at its Cowan, Tenn., plant and conversion of its Memphis gravel plant into a sand plant. It was indicated that the change at Memphis is contemplated in anticipation of the exhaustion of gravel reserves. Extent of the expansion at Cowan was not mentioned.

Kerr-McGee Oil Industries, Inc., Oklahoma City, Okla., has entered the potash mining field by concluding a deal with the National Farmers Union for the development of large deposits in southeastern New Mexico. Work will begin shortly on 13,000 acres which have been leased.

Directors of the Calaveras Cement Company have approved a $623,758 capital expenditures program for quarry, plant, and shipping department improvements in 1955.

The Completely NEW 'Jeep'®
More Rugged-Than-Ever

NEW, fully-boxed, front cross-member adds to the carrying strength, rigidity and rugged endurance of the frame.

NEW, sturdier body design with sheet metal flanged and overlapped for extra strength . . . center mounted to relieve road strain and for even greater sturdiness.

NEW, larger windshield has approximately 100 sq. in. of additional glass area and folds on stronger hinges. New streamlined hood offers increased visibility.

NEW, softer front seating is form fitting, bucket design with coil springing and gives a more comfortable ride.

Ask your 'Jeep' dealer for a demonstration.

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Greatest speed, power and work range of any full 1-yd rig!

It's the LS-98... another NEW Link-Belt Speeder

IN the full 1-yard class—they don't come any faster or more powerful than the new LS-98 Link-Belt Speeder! Since first introduced in May, coast-to-coast records prove *you get more productive capacity, no matter what the job!*

Speed-o-Matic power hydraulic controls make machine movements instantaneous, smooth, precise. Effortless operation helps increase output 25% and more.

You get more cycles too, because LS-98 has more "live" weight and structural strength to utilize extra useable hp. Combine this with exceptional maneuverability *plus* practical transportability—no wonder LS-98 is acclaimed today's greatest full 1-yard shovel-crane investment!

ATTENTION ALL SHOVEL-CRANE BUYERS:

Your Link-Belt Speeder Distributor is currently introducing a great deal of new equipment to help you make more money. So, before you buy a shovel-crane of *any* capacity for *any* application—be sure you check with him. You'll be glad you did.

LINK-BELT SPEEDER CORPORATION, Cedar Rapids, Iowa

A few of the many LS-98 features

★ **Speed-o-Matic controls** put LS-98's extra hp at operator's fingertips. Smooth dig-swing-dump action means more cycles per day.

★ **Foolproof power steering.** Every travel and operating action is controlled from operator's position, even setting the digging brakes.

★ **Power load lowering clutches.** Available for either or both main drums. An exclusive feature.

★ **Interchangeable, shoe-type clutches** are self-adjusting, internal expanding. Shells are high-friction alloy cast iron. All clutches interchangeable.

★ **Massive, dual, conical hook rollers,** riding on roller bearings in machined roller path, eliminate center pin pull and increase roller path life.

★ **Gears enclosed, running in oil.** All horizontal deck gears and swing-travel bevel gears enclosed and run in oil.

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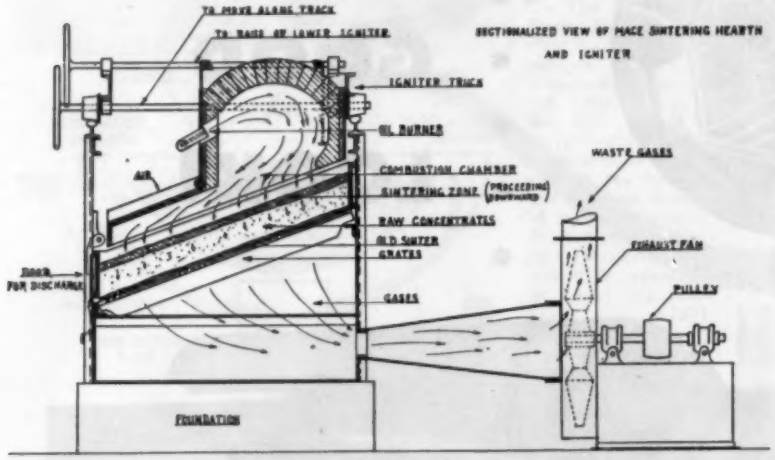
LINK-BELT SPEEDER

BUILDERS OF A COMPLETE LINE OF CRAWLER, TRUCK AND WHEEL-MOUNTED SHOVEL-CRANES

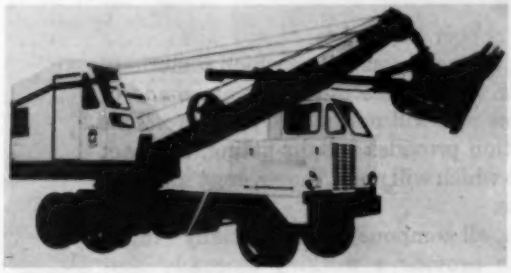
New Machinery and Equipment

(For more information, use card on p. 145)



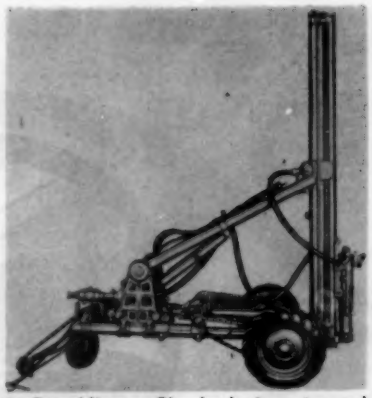
SECTIONALIZED VIEW OF MACE SINTERING HEARTH AND IGNITER

● Available in 7 standard sizes with a wide range in grate area, the Mace sintering hearth is ideal for agglomerating, blast roasting, and volatilization-sintering. A pneumatic piston discharge is utilized on all models but the two smallest. The smallest model has a 2½- x 5-ft. grate area while the other 6 range from 4- x 5-ft. to 4- x 60-ft. The unit is moderate in first cost, quickly installed, uses less power, does not require technical supervision or skilled labor, and is inexpensive and simple to operate. If the machine is installed according to the recommended layout, only one man is needed to operate the medium sizes. A laboratory model is also available which is a self-contained unit mounted on a bed plate with a 1-hp. motor connected to the fan by V-belt drive, and includes vacuum gauge and thermometer. The grate area is 10- x 16-in. and the hearth holds one cu. ft. of material. ▲(51)

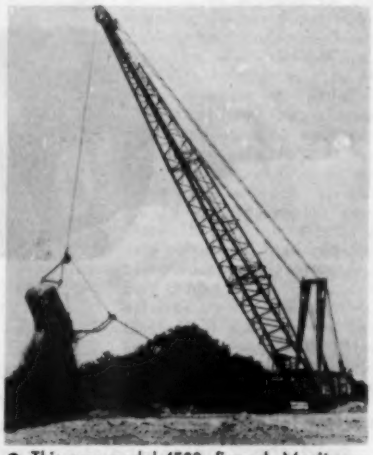


● The "Dixie Crane", an entirely new, high-speed, compact excavator in the ⅜ yd., 5-6 ton class, announced by Dixie Crane & Shovel Co. comes in either rubber tired crane carrier or on 20-in. crawlers. It converts to dragline, clamshell, grapple concrete bucket work, etc. Equipped as a shovel, the "Dixie" excavates to 18½-ft. heights, and dumps at 13 ft. ◀(53)

● One of 12 new tractor units introduced by the American Tractor Corp., the 1955 Model 500 Terra-Trac loader features advanced streamline styling, with improved operator vision; power-controlled dig and dump; longer, wider tracks; heavier track and side frame assemblies; simplified hydraulic system; and other refinements. Digging teeth for the bucket, or 5-tooth scarifier, are optional. ◀(55)



● By adding a Cleveland air motor and special axle to its popular DR-30 wagon drill the Cleveland Rock Drill Div. of the Le Roi Co. recently announced it has provided a self-propelled unit to meet the growing demand for more flexibility in deep-hole drilling power and to save set-up time. Power is transmitted from the air motor to the automotive-type axle by means of a fully-enclosed chain drive which has been exposed for viewing in the above photograph. ▲(52)



● This new model 4500, five-yd. Manitowoc dragline was put into service recently at the sand and gravel pit of the Southern Materials Company, Inc. near Chester, Va. This machine is handling a 7⅞ yd. drag bucket with a 120-ft. boom and as shown is stripping overburden from the sand and gravel. ▲(54)

● Wet mixed concrete wore through steel discharge chutes in less than sixty days at the Chester Materials Co. Redi-Mix concrete plant. Then it was necessary to stop production until the chute could be relined. A Gates Rubber Company representative suggested using the Gates rubber faced steel plate to the plant superintendent, who now says that his concern is saving greatly on shut-down time and is getting service 4 times longer than steel from the plates. ◀(56)

TAKE A GOOD LOOK!

When a skilled mechanic looks for trouble, he lifts the hood. And an engineer knows, too, that looking beneath the protective sheath is a good check on construction quality in mining machinery cable. The Hazaprene ZBF sheath on all Hazacords is tough and highly resistant to flame, oil, sun, water and acids. Yet the Hazacord components on the inside are equally important for long service life.

Take a look inside. First are the conductors, specially coated to resist corrosion. The large number and short lay of the strands plus the short lay of the insulated conductors provide an easy-to-handle flexibility.

Second, extra service life and protection are assured by Hazard's tough, resilient, heat-resisting rubber insulation.

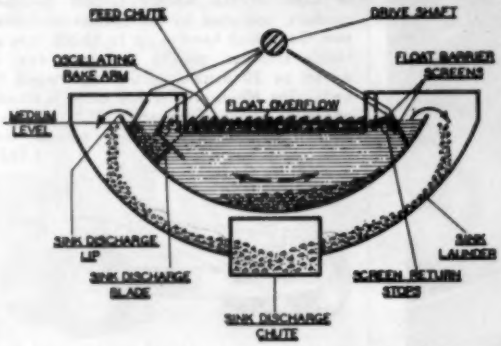
Third, unlike fibrous fillers which sometimes act like a wick, Hazacord fillers are made of Hazaprene and will not absorb moisture. This construction provides a tight-fitting, compact structure which will resist the severest mechanical abuse.

Fourth, all components are specially "lubricated" to provide a working assembly that insures maximum flexibility.

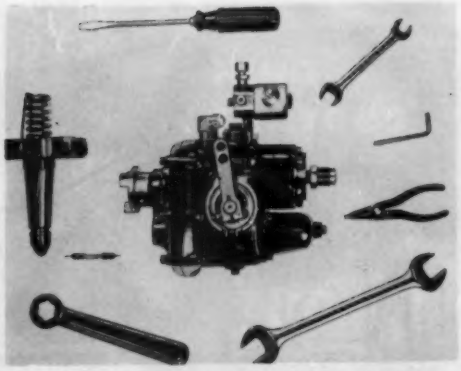
Inside and out, Hazacord mining machine cables are constructed to assure a minimum of trouble and a maximum of dependability. Write for the Hazard Mining Catalog. Hazard Insulated Wire Works, Division of The Okonite Company, Wilkes-Barre, Pennsylvania.

HAZARD *insulated cables*

1959



● A new heavy media separation vessel so simple that the entire separating process is performed without mechanism or power except that required for lifting the sink from the pool has been announced by The Ore & Chemical Corp. Six basic designs have been developed, which range in capacity up to 400 tph. Other features of the OCC vessel include low power requirements, no rotating parts in the medium, and complete visibility of separating process. It is self-starting, compact, and vibrationless, making it adaptable to almost any floorage. ←(57)



● The only tools needed for normal maintenance of the new Cummins PT fuel system — two end wrenches, one allen wrench, and an injector plug gage — are shown here with the new pump and injector. Field tests show that the pumps have operated over 250,000 miles without adjustment. It is believed to be the only commercial diesel fuel pump that does not have to be timed to the engine. ↑(58)

● To meet the need for a greater capacity hauling unit in the size powered by the Model C Tournapull, LeTourneau-Westinghouse Co. announces that the capacity of the new Model C rear dump has been increased from 18 to 22 tons. The struck capacity is now 14.7 yd. — its heaped capacity 17 yd. Ground clearance of the unit is now 22 in., which is 8 in. less than heretofore, therefore providing even greater stability. →(59)

● Designed primarily for soil sampling, the new Super Hole-A-Matic earth boring machines, made by Multi-Matic Corp., now digs holes from 2 to 16 in. in diameter at depths of 30 or more feet. The machines which require only one man to operate, save 95% of the time formerly required to do similar soil sampling, according to one engineering concern. The new model uses a hard pan boring head and cutting blades with tungsten carbide edges which grind and pulverize even the hardest soils. Lightweight and portable, the Super Hole-A-Matic operates in any location from the Gen-A-Matic portable gas engine or any similar power source. ←(60)

● Mid-Western Industries, Inc. has announced the 1955 model of the Davis front end tractor loader. Although still following the same functional design that permits all-around vision without obstructions, the new machine has many new features including double-strength lift arms because of the debossed box-type construction, down pressure on the lift rams for greater utility in excavating and maintaining grades, and rubber mounting which minimizes the shock load on the front of the tractor and shock slots that transfer the thrust to the rear. The loader also has a centralized reservoir which provides an exceptionally clean hydraulic system. The model 101 fits 2-3 plow tractors and the model 102, with twin dump cylinders, fits 3-4 plow tractors. Many attachments are available. ↑(61)

● Industrial Brownhoist Corp. has made delivery of the first of a new series of diesel-electric wagon cranes — a rubber-tired, 30-ton mobile unit. Billed as America's first rubber-tired, diesel-electric crane, it is equipped with 60-ft. boom, diesel engine rated at 165 hp. at 1800 rpm., dynamatic master clutch, and anti-friction bearings in all essential steering places. Designed for operation by one man, they will be made in 25-60 ton capacities, and mounted on 12-wheel crane carriers. ↑(62)

Sly Dust Collector, mounted high above the primary crusher is connected by duct work to various screens and transfer points throughout the plant.

SLY DUST CONTROL

Dust generated at one of the transfer points is drawn through the hood into the dust system. Note absence of dust—plant in full operation.

builds good public relations for New Jersey Quarry

One of the problems confronting the North Jersey Quarry Company in modernizing its plant was to control dust, for in recent years adjacent land areas had been developed into residential sections.

It was necessary to crush, size, store, and load out some 2,000 tons of material per day, without annoyance to alert owners of nearby homes.

The Company solved the problem successfully. They installed a Sly Dust Collector connected by ducts to every transfer point and screen throughout the plant.

This Sly system collects, depending upon the moisture content of the stone, from 3 to 5 tons of dust each day. The material is discharged once a day from the hoppers into a conveyor, then into a covered truck.

Expertly designed and built, Sly Dust Filters offer many advantages in greater filtering capacity, easier bag replacement, automatic control, and other features which spell low cost operation.

May we tell you more about Sly for your particular application?

THE W. W. SLY MANUFACTURING CO.

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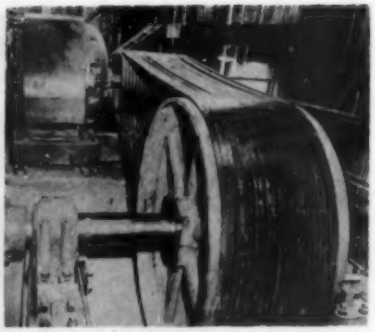
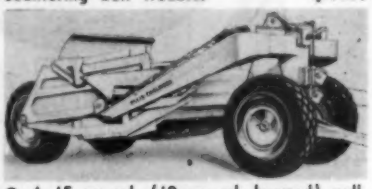
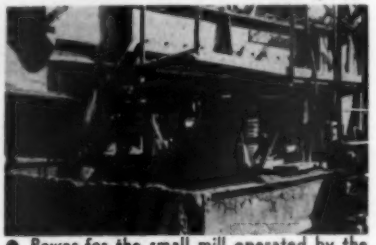
PIONEERS AND LEADERS IN INDUSTRIAL DUST CONTROL



● One of the world's largest gyratory crushers, operated by the Climax Molybdenum Co., which handles up to 30,000 tons of highly siliceous granite rock per day, is driven by 20 extra-duty Durkee-Atwood V-belts. The 60-in. crusher has been in steady operation since February, 1953, crushing over 4,560,000 tons of ore, without encountering belt trouble. ▲(63)

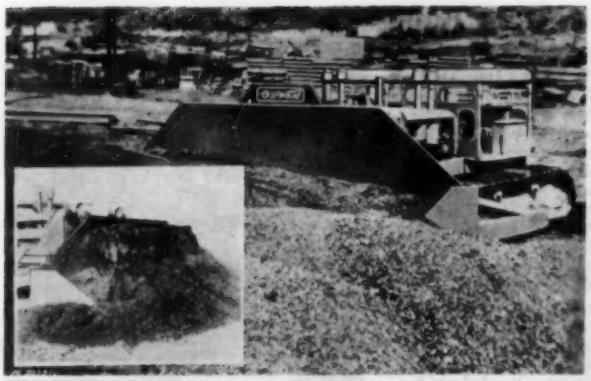


● A 15 cu. yd. (19 cu. yd. heaped) pull-type scraper has been added to the Allis-Chalmers line. Cable controlled, it features positive forced ejection, and provides a 9 ft. 8 in.-wide cut with its carbon-steel, heat-treated, offset type cutting edge. Model 315 is 33-ft. 5-in.-long, 11-ft. 6¾-in.-wide, stands 8-ft. 8-in. with blade on the ground, and is 9-ft. 2-in. high when blade is raised. ▲(64)



● Power for the small mill operated by the Interstate Asphalt Co. at Aberdeen, Wash., is supplied by an International UD-6 diesel engine, shown on the Cedar Rapids drier; and an International U-264 power unit driving the 4x16 batch mixer. A Hough H.F. Payloader feeds the mill from nearby stockpiles to keep production at 60 tons per hour. ▲(65)

● The new "Payloader" tractor-shovel model HRC, made by the Frank G. Hough Co., is a 4-wheel-drive machine with bucket capacity of 1 cu. yd. struck-load, and 1-1/3 yd. heaped payload. It is available with either gas or diesel engine and has the Hough heavy-duty full-reversing transmission which provides 4-speed ranges in both directions. ▲(66)

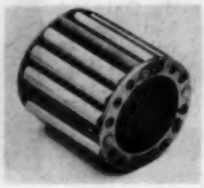


● The new Gar Wood bulldozer blades are among the largest made having a moldboard measuring 5 ft. high and 24 ft. long. The giant dozers with the big bite have been mounted on two Allis-Chalmers HD-20 crawler tractors which have been welded together to operate as one tractor to supply the power needed to move the many tons of material handled by the dozer. ←(67)

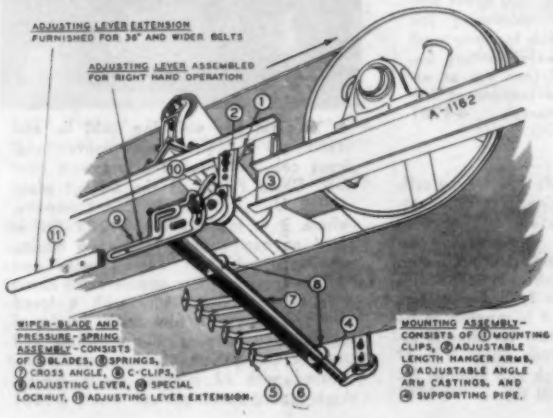
● Lincoln's new hydraulically-operated valves for dispensing predetermined, measured quantities of lubricant are now available with any discharge output range. They are for use with a 4-way control valve, which is supplied with lubricant from a power-operated pump. ↑(68)

● Mixermobile's 1 cu. yd. LD5 front-end loader is literally dwarfed by the firm's new LD20, 47,820 lb. front-end loader shown here with a 10-cu. yd. bucket. Also available with a 4-cu. yd. bucket, the machine has hydraulic boom lifting capacity of 18,000 lb. with a bucket discharge height of 14 ft. Powered with a heavy-duty diesel engine and boasting twin disc torque converter, power divider, and three-speed transmission, it has a top speed of 16 m.p.h. It is 9 ft. 4 in. high, 12 ft. wide, and is 32 ft. 8 in. long including the bucket. ↑(69)

● Featuring stepless current, silicone insulation, and aluminum coil windings, the G. E. A-C welders come in NEMA rated 300, 400, and 500 amp models. A large convenient current scale enables the operator to read it from a considerable distance without returning to the welder. They are especially suited for heavy section welding where high current is desirable and when arc blow would otherwise cut welding speed and quality. Additional features include: an automatic hot start which provides an extra surge of current for easier starting, arc stabilizing capacitors, and power-factor capacitors. ←(70)



● Needing neither inner nor outer race, this self-contained steel cage type roller bearing can be used directly on a hardened shaft or sleeve and in a hardened housing. By running directly on a hardened shaft it can support fairly heavy bearing loads. This Rollway bearing's rollers are only 5/16-in. in diameter. ↑(71)


ADJUSTING LEVER EXTENSION FURNISHED FOR 36" AND WIDER BELTS
ADJUSTING LEVER ASSEMBLED FOR RIGHT HAND OPERATION
A-1182
WIPER-BLADE AND PRESSURE-SPRING ASSEMBLY - CONSISTS OF (3) BLADES, (8) SPRINGS, (7) CROSS ANGLE, (8) C-CLIPS, (9) ADJUSTING LEVER, (10) SPECIAL LOCKNUT, (11) ADJUSTING LEVER EXTENSION.
MOUNTING ASSEMBLY - CONSISTS OF (1) MOUNTING CLIPS, (2) ADJUSTABLE LENGTH HANGER ARMS, (3) ADJUSTABLE ANGLE ARM CASTINGS, AND (4) SUPPORTING PIPE.

● By removing material adhering to the belt after discharge, this Stephen-Adamson spring-type conveyor insures maximum belt life by preventing cover wear. The adjustable spring steel arms have a twist in the arm so that a vertical edge is exposed to the dribble falling from the wiper blades which eliminates any build-up ←(72)

MINING OPERATORS USE McCarthy Drills

Heavy-Rugged Powerful

AT Bessemer Limestone & Cement Co., Bessemer, Pa., one McCarthy unit (above) averages 90 ft. per hour, drilling through hard blue shale and sand rock 34 ft. deep. Blast holes are drilled on 18-ft. centers. Two men handle the whole job, including setup and moving. McCarthy drills operate with gasoline, diesel or electric power units . . . on all types of mounts. McCarthy "money-savers" can work for you. See your nearby distributor or write Salem Tool direct for further information.

SALEM
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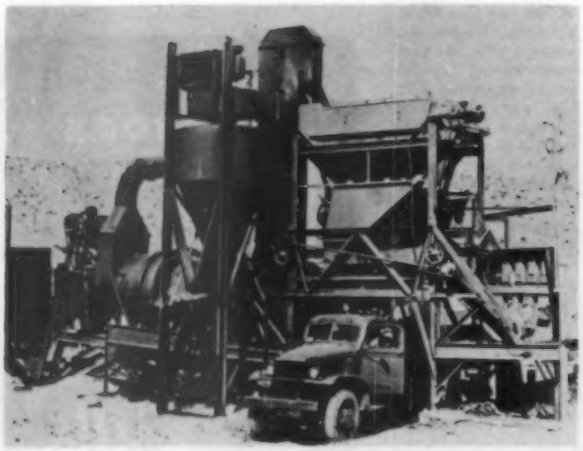
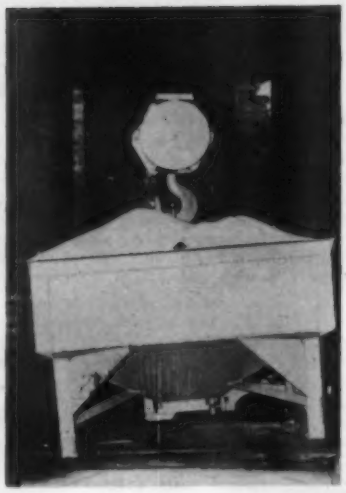
SALEM, OHIO · U. S. A.



● Standard Steel Corp. says their new Model TM portable asphalt plant is the only completely portable batch-type asphalt plant on the market. The heavily-braced welded steel framework withstands torsion and stress in transit and is mounted on heavy-duty pneumatic truck tires. It can be hauled into even the most rugged areas without fear or trouble. ←(73)

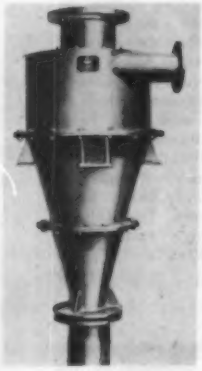
● Although it is a light-weight, low-cost vibrating feeder, this Barber-Greene "Redi-Flow" is capable of capacities in excess of 300 tph. It is made in 20- and 26-in. widths and handles up to 12-in. lumps when mixed with fines, or up to 8-in. maximum when lumps are of uniform size. ↑(74)

● Faster and safer unloading of sand from rail cars is achieved with the highly maneuverable Hyster "20" lift truck with scoop attachment working inside the car. The new 4-ton, self-dumping, portable hoppers replace the old 1-ton hopper which had to be hand dumped. Only 12 crane trips are required instead of 48 because of the hopper's large capacity. ←→ (75)



● Industrial Electrical Work's new Spring-O-Matic Powereel features automatic operation which simplifies and speeds up pay-out and take-up of electrical power supply cables on hoists, cranes, and mobile equipment. ↑(76)

● Shown above is the E-1207-B Tru-Rol cylindrical roller bearing in its new packaging. This roller bearing, which is manufactured by the Rollway Bearing Company, boasts such features as a separable inner race, stamped steel retainer, and crowned rollers. Each roller bearing is thoroughly inspected, cleaned, and lubricated before it leaves the factory. (77)



● Smith Engineering Works, licensed by the Dorr Co. to market the DorrClone in the aggregate industry, says the 24-in. sand DorrClone offers these important advantages: recovery of practically all of the fine sand ranging in size from minus 30 mesh down to 200 mesh; and great savings by recovering this sand which formerly went to the water settling basins, and then was an expense to remove at frequent intervals. ←(78)

● A giant tire weighing 2600 lb. and standing 8 ft. high dwarfs a conventional truck cab and tire. It also towers over 6-ft. Clyde Prince of the Detroit plant of the United States Rubber Company, where it is made. The 30.00-33 tire is used on earth-moving and strip mining equipment, bottom dump trucks and self-loading scrapers; and contains about two miles of bead wire with a tread which is nearly 3½-in. thick. Made of nylon, they have a 40-ply rating and require curing time of 16 hours as contrasted with 17 minutes for a typical high-quality passenger car tire. ↑(80)

● This new Davey self-contained, truck-mounted rotary drill employs both compressed air and high pressure water. Available in capacities up to 2,500 ft. of 8-in. hole it is reputed to be excellent for mineral exploration work. It is 37 ft. high and handles 20-ft. drill stems. ←(79)

P&Q *product briefs*

(use reply card for more information)

CYCLONE MUFFLER. When installed on gas or diesel powered trucks, this Yale cyclone muffler reduces the possibility of ignited exhaust particles acting as a source of ignition to combustible material. It is now standard on all Yale diesel trucks and available at a slight additional charge for gas engines. Being of the dry type, the muffler does not require water, and since there are no moving parts no servicing is needed.

Circle No. 81

•

SEVERE SHOCK LOADS are all in a days work for this extra-heavy-duty, six-wheel International Harvester RF-230 truck which weighs in at a gross vehicle rate of 60,000 lb. Powered by the firm's new RD-501, 201 hp. engine, the truck is designed for use in earth-moving operations, quarry work, 8- or 9-yd. concrete mixers, and similar applications. Equipment includes hydraulic, full power steering, air brakes, and 12-volt electrical system.

Circle No. 82

•

MAGNETIC DISC BRAKES with various maximum torque ratings ranging from 10 to 105 lb. ft. are available from Stearns Magnetic, Inc. Up to 15/16 in. shorter than previous brakes, it is designed to mount on new frame sizes 213 through 286. A feature of this H-70 line is the manual release-automatic reset wear indicator recently introduced by the firm.

Circle No. 83

•

A PLASTIC AIR HOSE for use with pneumatic tools, called the Bostrene by Woven Hose & Rubber Co., is claimed to be not only lighter and more flexible but flame and abrasion resistant as well. Because of its light weight, lighter pneumatic tools may be used in place of heavier electric ones and savings on costs of manual lubrication of tools are effected by allowing the use of line oilers.

Circle No. 84

•

PORTABLE VENTILATOR. Used as a blower or as an exhauster, this two-way ventilating system made by the Mine Safety Appliances Co. removes toxic air from manholes, tunnels, cement unloading locations, and other such areas. Driven by a powerful 3450 rpm, explosion-proof motor, it is capable of moving approximately 3000 cu. ft. of air per minute.

Circle No. 85

•

POWER CABLE. John A. Roebling's Sons Corp. is making available commercially the solid-type impregnated paper-lead power cable with tellurium alloy lead sheath which was recently developed by General Electric. Cable sheaths made of this alloy have shown that it possess stabilized bending and creep resistant properties of superior quality.

Circle No. 86

•

BATTERY CHARGING is a snap with this Lincoln charger for lead acid industrial truck batteries. Two models are available in the firm's Precision-Charge line—one for charging 6-cell, 250-650 ampere hr. capacity batteries; and the other for 15-18 cell, 300-700 ampere hr. capacity batteries. Rate of charging is automatically controlled to match the voltage curve of the battery.

Circle No. 87

How Bemis makes • GOOD multiwall bags for you

A. R. Ewing, director of the Bemis Paper Control Laboratory, has twenty-nine years' experience in this field. He is shown operating the laboratory's electro-hydraulic tensile tester, one of the many precision devices that go to make the Bemis laboratory probably the most complete in the country devoted entirely to bag papers.

Use good paper... test it... prove it!

Bemis sets high standards for the various papers used in making Bemis Multiwall Bags. And we are able to maintain these standards because we buy our paper from a variety of top sources. These multiple sources are the key . . . if one should fall below par, the others are there to supply our needs. We don't have to take less than the best.

Bemis

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Workmen installing a total of two hundred and eighteen feet of General Refractories GR-23 Insulating Fire Brick in a 12 foot diameter cement kiln.*

GR-23
INSULATING FIRE BRICK

for exposed rotary kiln lining...

General Refractories Company has sold insulating fire brick for exposed lining in cement kilns from Maine to Mexico, from California to Puerto Rico.* The initial installation was not made until after General Refractories research indicated its success. It is still in service after five years. Write for full information.

**Names and locations on request*

GENERAL REFRACTORIES

Ontario's New Slag Operation

This view of National Slag's hard slag plant at Hamilton, Ont., shows the trend to horizontal design, which spreads the operation over an extensive ground area, in order to permit large stockpiles. In the left background is the primary crushing and screening station, in the center background the two screening stations. Five radial stackers serve the plant.

another ON THE SPOT report

National Slag builds lightweight and hard slag plants at Hamilton

By KENNETH A. GUTSCHICK

IN order to meet the rapidly growing demand in southeastern Ontario for mineral aggregates, including lightweight materials, National Slag Ltd., a newly-formed company*, recently opened up a modern well-designed two-plant operation in Hamilton; the new plant is one of the finest in the industry. Built at a cost of approximately $1,000,000, the plant comprises two entirely separate production units—one producing lightweight slag aggregates and the other air-cooled or hard slag aggregates. The two operations are located side by side on a 45-acre plot along Queens Highway No. 20A in eastern Hamilton, about two miles from the two local steel mills where the raw slag is obtained. By turning out several hard slag products ranging from 3-in. to screenings, as well as both coarse and fine expanded slag, the firm serves a diversity of markets in the Hamilton-Toronto area.

A pair of 60-in. reciprocating feeders, discharging to an apron feeder, start the flow in the hard slag plant. The iron picking area is to the left.

The two plants were built during 1954, the lightweight operation starting up in June and the hard slag plant about four months later. The Canadian firm, however, actually got its start in the slag business in Hamilton about a year earlier, having marketed locally obtained pit-run material, which was used primarily for fill. At one stage during its brief history, the firm operated a portable slag crushing plant in order to produce minus 1-in. crusher-run material. Since the current demand for pit-run slag is still high, the company still maintains this operation. Crusher-run production, on the other hand, is handled entirely at the new hard slag plant.

The new facilities were added at Hamilton in order to enable the firm

*The company was formed from interests representing The Buffalo Slag Co., Inc., Buffalo, N.Y.; the Canada Crushed and Cut Stone Ltd., Hamilton, Ontario; and Standard Paving and Materials, Ltd., Toronto, Ontario.

to expand and diversify its product lines so as to include both conventional and lightweight aggregates. The decision to go ahead with the million-dollar venture was based on the fact that Hamilton, strategically located at the western end of Lake Ontario, is one of Canada's fastest growing and richest cities. National Slag officials had confidence that the demand for construction materials would continue at a high rate, and further that new markets would ultimately develop for their versatile slag product. Present markets which have already developed in the firm's brief history include both lightweight and conventional aggregates for concrete and concrete block, lightweight precast concrete units, bituminous aggregates, roofing material, ballast, mineral wool, and fill. The market area envelops not only the Hamilton metropolitan district but also extends about 60 miles eastward to include Toronto.

From an operating standpoint the new Hamilton plant typifies a trend in the slag industry, whereby the various plant facilities are spread out rather than confined to single or multiple mill buildings; this plan, of course, allows adequate space for both a surge pile and several stockpiles. To tie together the various plant units, the designers provided a maze of belt conveyors.

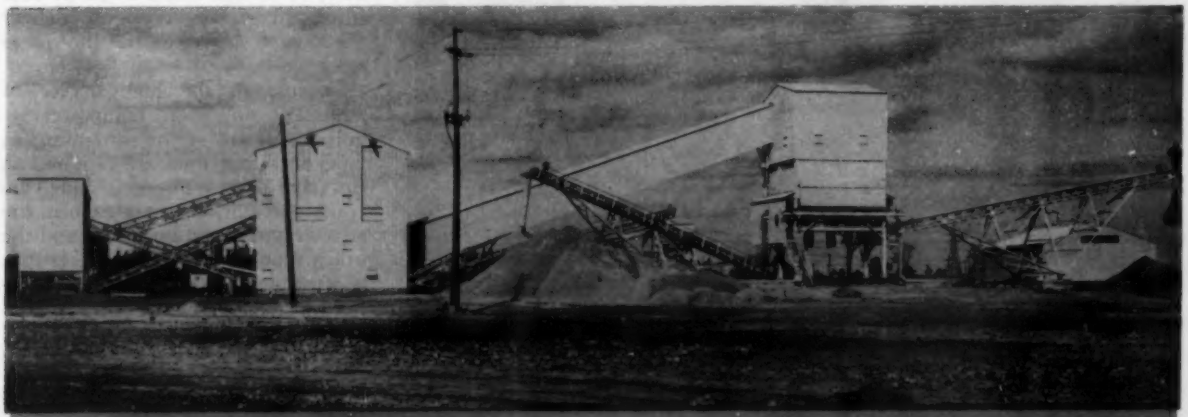
In addition, radial belt stackers are integral parts of the overall plant setup. Five stackers are used in the hard slag plant, and two in the lightweight plant. In the former operation the aggregate either can be fed to stockpile directly or can be discharged to a short belt conveyor leading to a combination truck-rail storage hopper.

Here's an Idea. . . .

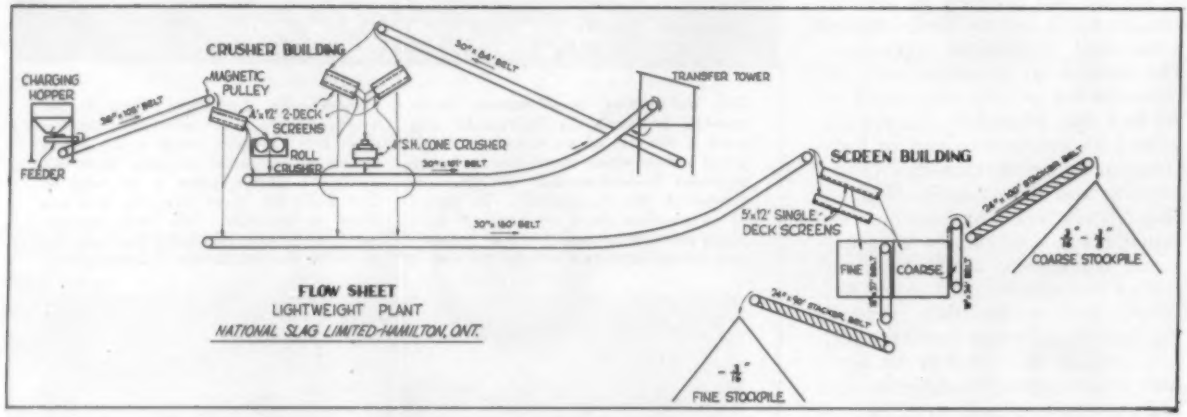
One outstanding novel feature incorporated in National's lightweight slag plant is the use of an automatic stockpiling system which serves the four-compartment finished-product bin structure (shown in the foreground). By means of an overflow chute arrangement built along one side of each bin pair (arrow), any excess aggregate fed to the bins is automatically discharged through the overflow chute to a continuously running short belt conveyor, which in turn leads to one of the radial stackers. With this automatic design, there is no need to shut down the plant when the bins are filled to capacity. This neat arrangement, of course, eliminates the need for an extra man to handle the stockpiling.

Lightweight Slag Plant

Expanded slag for the lightweight plant is obtained from a new 1,500-ton blast furnace operation of the Steel Company of Canada in Hamilton. Molten slag is tapped from the furnaces, and expanded by means of the Kinney-Osborne process. In this process, which is also used at a few American slag plants, the molten material is immediately fed to an insulated reaction chamber, where it is subjected to a high-pressure application of steam, air, and water; this jet-like action of the steam, air, and water meeting the molten slag stream produces a highly cellular lightweight clinker. The clinker is then fed to an outside storage area *via* an 8-ft. wide drag chain conveyor; the material remains on the conveyor for a critical period of 1¼ minutes, during which time it is initially air-cooled. Further cooling (by air only) occurs in the stockpile. Slag is then reclaimed from storage by means of a Caterpillar D6 tractor fitted with a front-end loader. The 2-mile haul to the National plant is handled by a fleet of White



A general view of National's companion lightweight slag plant, showing (left to right) the transfer tower, the crusher building, and the finish screening building. Radial stackers lead to the fine and coarse slag stockpiles.



Flow sheet of expanded slag plant.

6-wheeler trucks fitted with King bodies, which are specially reinforced in order to handle the warm material; loads average 18 cu. yd.

The lightweight plant has a simple flowsheet design and consists basically of two main facilities—a crusher building and a screen building; it has a capacity of 90 t.p.h. Material is transferred from the clinker slag stockpile to a 25-cu. yd. charging hopper by a Marion 1¾-cu. yd. diesel crane; it is then delivered by a reciprocating feeder and 36-in. inclined belt conveyor to the crusher building. A Dings magnetic pulley mounted at the head end of the conveyor removes any iron particles present in the slag, the deleterious material being chuted to the ground.

The clinker slag is first scalped on a Deister Type UHS* 4- by 12-ft. 2-deck screen, which is fitted with wire cloth having ½-in. and ⅜-in. openings, respectively. The desired product (minus ⅜-in.) is transferred on a 30-in. by 180-ft. belt conveyor to the screen building for final sizing. If a coarser aggregate is required, it is also possible by means of a gate arrangement to divert the rejects from the bottom deck and chute them directly to the main 180-ft. conveyor.

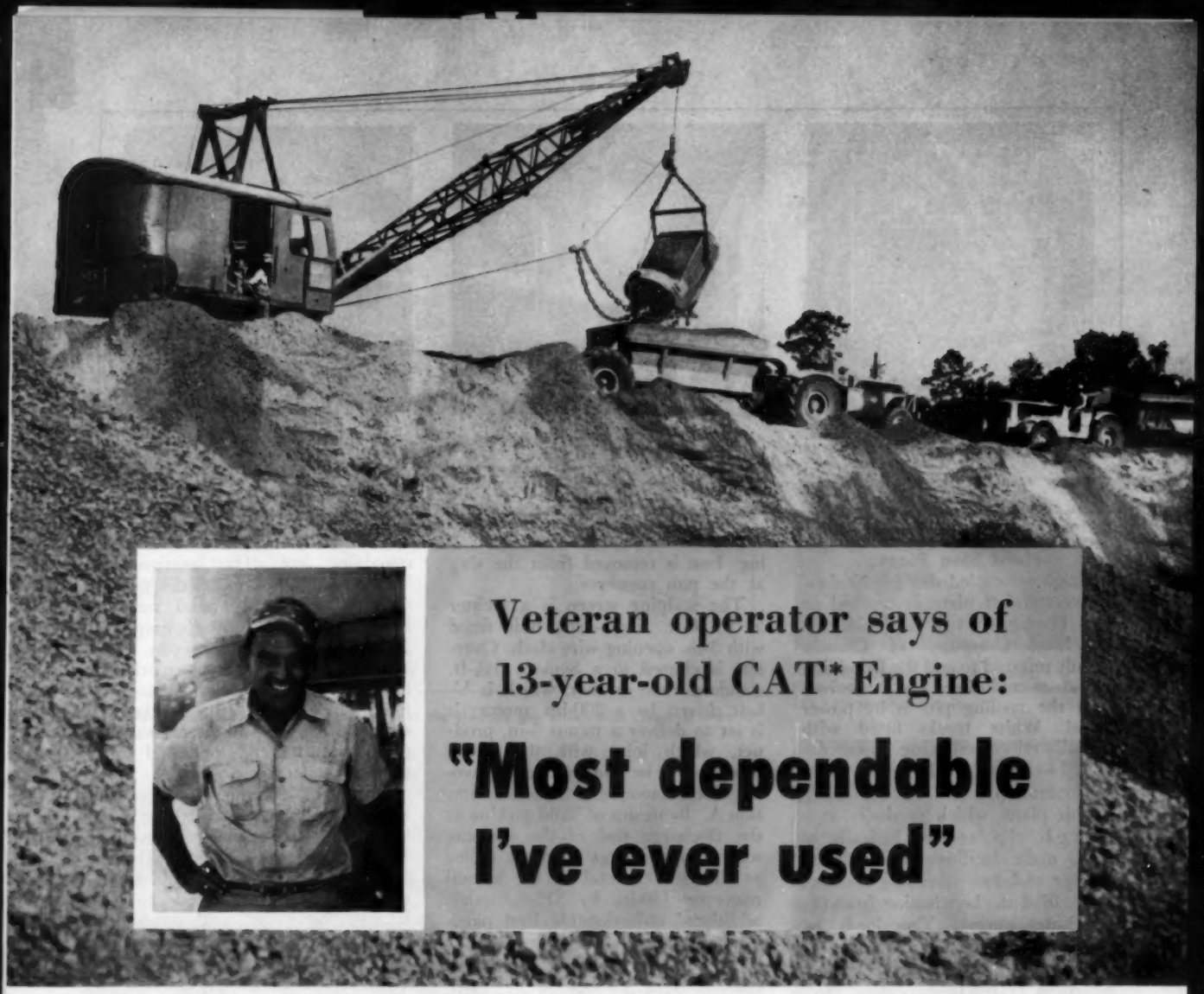
Rejects off the top deck are chuted to the primary crusher—a Bonded Scale No. 2836C double-roll spiked-tooth unit; each roll is V-belt driven by a 20-hp. motor. The crusher throughs in turn join with the minus ½-in. slag from the scalping screen and are conveyed *via* a two-stage 30-in. belt to a pair of double-deck 4- by 12-ft. secondary screens, which are also located in the crusher building. These units are operated in conjunction with the secondary crusher—a Symons 4-ft. shorthead cone, which is V-belt driven by a 75-hp. motor. Like the primary screens, the secondary units both have the same size of wire cloth. Plus ½-in. (or plus ⅜-in.) is chuted to the cone crusher, the crusher product being recircuited to the secondary screens. The desired product—minus ⅜-in. (or minus ½-in.) is then conveyed on the 180-ft. belt conveyor mentioned earlier to the screen building. Thus all of the throughs from the three screens in the crusher building represent finished product, which is later sized in the screen building.

Final screening is accomplished in a pair of Deister 5- by 12-ft. single-deck screens, fitted with wire cloth having 3/16-in. openings. The two finished products—coarse and fine—are stored in the four-compartment bin mentioned in the introduction. Bin storage capacity approximates 160 cu. yd. Two of the bins (one coarse and one fine) are mounted over track, thus permitting rail shipping; the other two are served by truck. Overflow material from the two fine bins is automatically conveyed on a short 18-in. belt and a 24-in. by 90-ft. radial stacker conveyor to outside storage. Another short 18-in. belt and a 24-in. by 100-ft. radial stacker conveyor deliver the coarse aggregate to the other stockpile.

Because of the high degree of automatic operation, manpower requirements are at the minimum; in fact, only four men are required to run the plant. These include the crane operator, one man each in the crusher and screen buildings, and the utility man, who generally takes care of truck and car loading. The operation of the stackers is controlled from the electrical control panel located on the screen floor of the screen building.

Charging the feed hopper of the lightweight slag plant with a 1¾-cu. yd. clamshell.

*All of the vibrating screens used in both plants are Deister Machine Co. UHS models. In the lightweight plant the units are mounted at 15 deg. and vibrate in the direction of flow; in the hard slag plant they are mounted at 20 deg. and vibrate counter-flow.



Veteran operator says of 13-year-old CAT* Engine:

"Most dependable I've ever used"

"I've been with this machine for three years, and an operator for 16 years," says C. S. Batson, operator for Reynolds and Williams, Little Rock, Ark., "and Cat Engines are the most dependable I've ever used." He is shown here with a Northwest Shovel whose Caterpillar D13000 Engine is 13 years old.

The shovel loads out five Caterpillar DW10s and W10 Wagons, 20 loads of base gravel per hour, for an 11-mile stretch of State Highway No. 4 near Little Rock. In one 21-day period, the company put down 35,000 cu. yd. on this stretch. The shovel strips topsoil for three hours, and then loads gravel for 10 hours every day. Output is 360 cu. yd. of topsoil and 1800 cu. yd. of red clay gravel daily.

That's high production for a shovel whose engine is a veteran of more than 40,000 hours. All Caterpillar Diesels are built to deliver many thousand hours of economical, pamper-free performance, thanks to such features as specially hardened crankshaft journals and long-lived aluminum alloy bearings. Really efficient filters and seals protect every engine's factory-built precision, even in abrasive dust working around rock. Important in cutting costs is the ability of every Caterpillar Diesel to deliver full and *foul-free* power on inexpensive No. 2 furnace oil.

There are 12 sizes of Caterpillar Engines and Electric Sets, to 500 HP and 315 KW. Leading manufacturers can supply Caterpillar power in their excavators, compressors, with rock crushers and other machinery. Your Caterpillar Dealer — who provides fast service and genuine factory parts — can help you select the Cat power unit that will do most work at lowest cost for *you*. Call him today.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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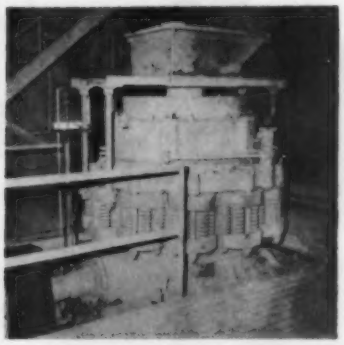
SPECIFY CAT POWER FOR HIGH-PROFIT PERFORMANCE

The 4- by 12-ft. 2-deck scalping screen.

The spiked-tooth double roll crusher.



The 4-ft. short-head cone crusher.

Three views of major equipment in the lightweight plant. Rejects from the scalping screen are fed to the roll crusher. The cone crusher is operated in closed circuit with a pair of secondary screens (not shown).

Hard Slag Plant

Rough air-cooled slag for National's companion plant is trucked in from Hamilton's two steel plants—the Steel Company of Canada already referred to and the Dominion Foundries and Steel Ltd.; recovery from the cooling pits is by power shovel. White trucks fitted with specially-reinforced King bodies deliver 14-cu. yd. loads to the hard slag operation.

This plant, which produces at a 150-t.p.h. clip, consists basically of three main facilities—the primary crusher and two screening stations, with radial stackers issuing from the two latter stations. Truckloads are discharged into a pair of 30-cu. yd. hoppers mounted over two Stephens-Adamson 60-in. reciprocating feeders. Then *via* a 42-in. by 68-ft. pan conveyor and a 42-in. belt conveyor the material is delivered to the scalping screen. By means of hand picking, iron is removed from the slag at the pan conveyor.

The scalping screen is a Deister 5- by 8-ft. single-deck unit fitted with 3-in. opening wire cloth. Oversize is chuted to a Symons 5½-ft. standard cone crusher, which is V-belt driven by a 200-hp. motor; it is set to deliver a minus 3-in. product, which joins with the screen throughs to be conveyed on a two-stage belt conveyor to Screening Station A. By means of hand picking at the discharge end of the scalping screen and a Dings magnetic pulley at the delivery end of the second conveyor (30-in. by 315-ft. unit), additional objectionable iron particles are removed.

The first screening station (A) consists of a Deister 5- by 14-ft. double-deck screen which produces the coarse slag products. Rejects off the top deck (2- to 3-in.) are transferred on a short 36-in. belt conveyor to one of the five 24-in. by 100-ft. radial stackers in the plant. A second Dings magnetic pulley, used on the short 36-in. belt unit, removes any remaining iron. The intermediate fraction (1¼- to 2-in.) is discharged directly to second radial stacker. Both stackers in turn discharge to 24-in. by 70-ft. belt conveyors feeding a two-compartment truck-rail hopper. When each compartment is filled to capacity, the stacker is swung around to feed direct to stockpile. Each stacker is operated from the screen floor of Station A.

Minus 1¼-in. slag produced on the first finish screen is delivered on a 30-in. by 270-ft. belt conveyor to Screening Station B, where a Deister 5- by 12-ft. 3-deck screen produces the finer sizes, including ½- to 1¼-in., ⅛- to ½-in., and screenings. (The middle deck is used as a relieving deck in order to effect efficient separation on the bottom ⅛-in. deck).

The conveying setup for the coarse and medium aggregates is identical to that used at Screening Station A,

This pair of single-deck 5- by 12-ft. screens produce the coarse (¾ to 3/16 in.) and fine (minus 3/16 in.) lightweight slag.

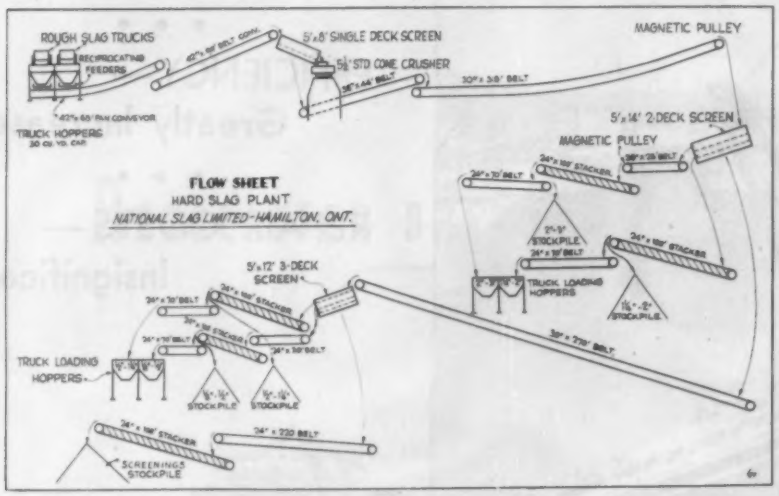
Dumping clinker slag into the primary hopper of the hard slag plant. The truck body is specially-reinforced in order to handle the hot material.

that is, a pair of radial stackers delivers the materials either to stockpile or to 24-in. by 70-ft. belt conveyors which charge a 2-compartmented truck-rail hopper. Delivery to the screening stockpile, on the other hand, is *via* a 24-in. by 220-ft. belt conveyor, followed by a radial stacker. This stacker also handles crusher-run material when it is being produced; in this case the minus 1¼-in. slag coming from the 5- by 14-ft. screen at Station A bypasses the 3-deck screen (that is, the decks are removed); and the material is fed directly to the screenings conveyor.

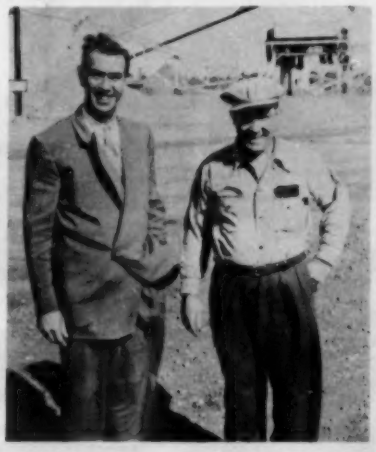
Multiple Uses of Products

A wide variety of markets has already been developed for National's slag output. The lightweight slags are

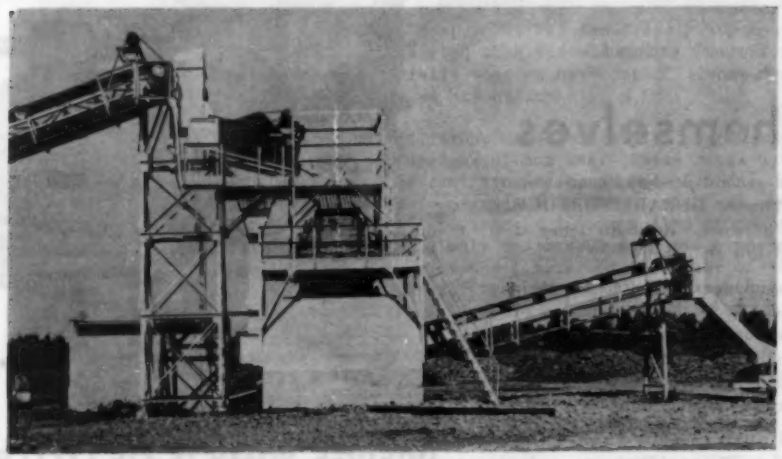
(*Continued on page* 140)



Flow sheet of the hard slag plant. Note that the stackers are shown with diagonal lines to distinguish them from the belt conveyors.



R. D. Margesson, sales manager, and William England, superintendent, National Slag Ltd., Hamilton, Ontario.



Above: View of the primary crushing station, showing the 5- by 8-ft. scalping screen which rejects plus 3-in. slag to the 5½-ft. cone crusher.

Below, left: Stockpiling is handled in the hard slag plant by 100-ft. radial stackers; each stacker leads to a yard hopper (via a short belt) or to stockpile.

W. F. Pierce and G. S. Snyder (Buffalo Slag Company), who designed the slag plants at Hamilton.

Below, right: Loading from stockpile is handled by a front-end loader fitted with a 1½-cu. yd. bucket. Yard hoppers are also used in the hard slag plant for loading.

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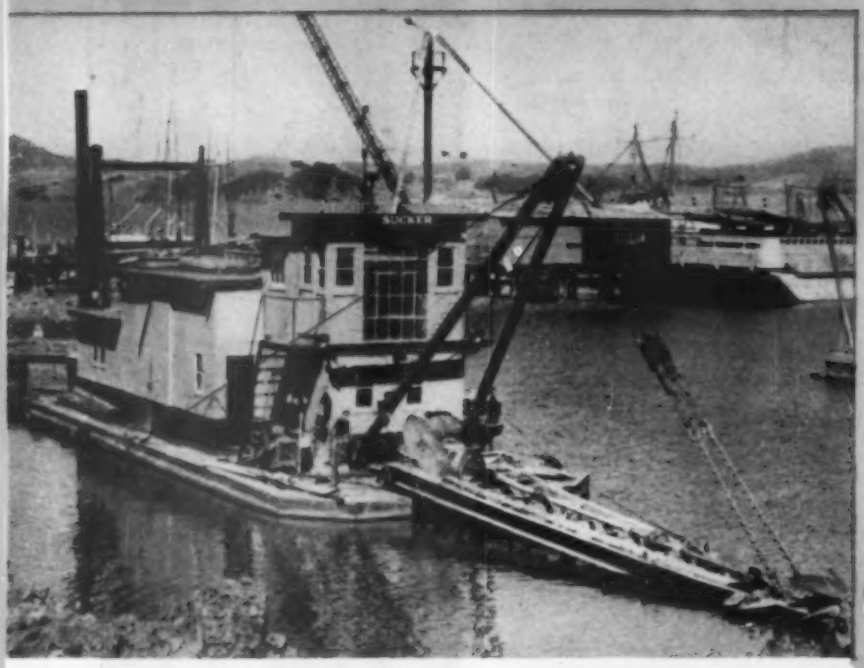
REPAIR COSTS—
Insignificant!



Dredge "Sucker" of Associated Dredging Company equipped with a Thomas 14" Durable Pump.

They Pay for Themselves

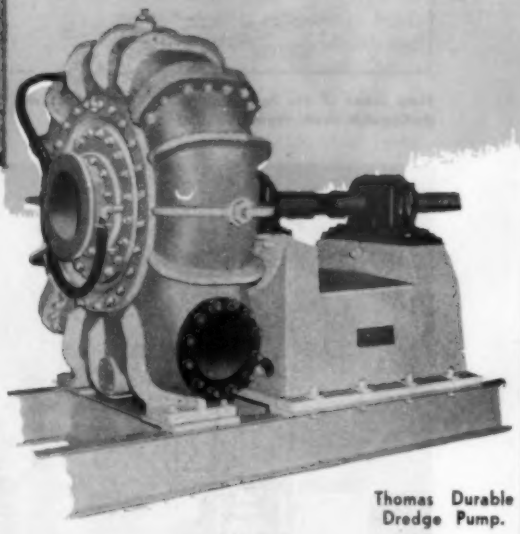
This California pump user, an experienced general dredging contractor, is another of our best boosters. Users of Thomas DURABLE DREDGE Pumps, like him, are our best volunteer salesmen. Read his letter at the right, to which we would like to add this thought:

Superior design of Thomas Pumps is not alone responsible for their low maintenance and long life . . . instead it is the combination of improved design, the use of oversize shaft and bearings, and the use of modern, ABRASION RESISTANT material (Thomas NI-HARD) in their manufacture that makes the difference. Thomas Pumps are designed for NI-HARD, designed to outlast conventional pump materials.

No wonder Mr. Rich plans to replace all of his pumps with Thomas Durables. He, like others, has found that Thomas Pumps *pay for themselves* . . . through increased production . . . through reduced down-time for repairs . . . through minimized repair bills.

How would a check list on your pumps doing general dredging or handling sand and gravel compare with this experience of Associated Dredging Company?

Can you afford to continue using pumps that are less efficient or less durable or cause excessive down-time for repairs and frequent maintenance, when more efficient, more productive, longer lived, proven and dependable Thomas Durable Dredge Pumps are readily available?



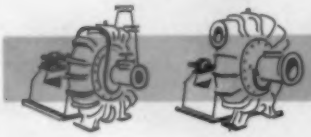
Thomas Durable Dredge Pump.

THE FIRST COST OF A DREDGE PUMP IS OF LITTLE CONSEQUENCE

Consider instead: How much material it pumps . . . cost of repair parts . . . cost of maintenance labor.

Thomas Pumps are not the lowest priced but you can't beat their over-all low production cost.

If you do it with a Dredge Pump, you can do it better and cheaper with a "Thomas".



THOMAS FOUNDRIES Inc.

P. O. BOX 1111, BIRMINGHAM, ALABAMA

Read this Letter
FROM CALIFORNIA

ASSOCIATED DREDGING COMPANY

PHONE SAUSALITO 70
1702 BRIDGEWAY BLVD.
SAUSALITO, CALIFORNIA

October 8, 1954

Thomas Foundries, Inc.
P. O. Box 1111
Birmingham 1, Alabama

Gentlemen:

A number of months ago we replaced the pump on our dredge "Sucker" with one of your 14" Thomas pumps. It was immediately apparent how much more efficient this pump operated than our old pump. Production of our dredge has increased so materially that we have just finished two jobs in about one half the time that we had estimated.

We have operated different makes and styles of pumps in all sizes from 6" to 20" on various dredges of our own. These pumps have been made of almost every material from cast iron to manganese. It has been quite surprising and pleasing to us to operate this Thomas pump and check our repair costs against our normal experience. In six months of operation with the Thomas pump we have replaced only two rubber seal rings whereas normally we would have completely rebuilt the liners and impellers of any other pump. The time lost in dredge operation for pump repair has been so small that it is completely negligible.

I believe that a good portion of this low maintenance cost is due to the oversize shafts and bearings with which your pump is built. It is our intention to replace, in the near future, some of the pumps on our other dredges with Thomas pumps of equal size.

Again I wish to reiterate that we are convinced that the low maintenance cost produced by your pump is due to it's superior design. We had not thought it would be possible to design a pump which would accomplish this so materially.

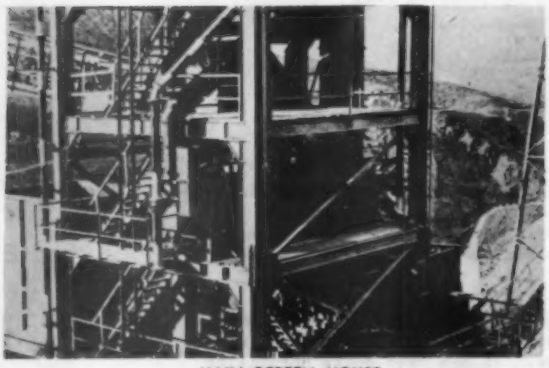
Sincerely yours,

ASSOCIATED DREDGING COMPANY

R. E. RICH, Vice-President

RER/bd

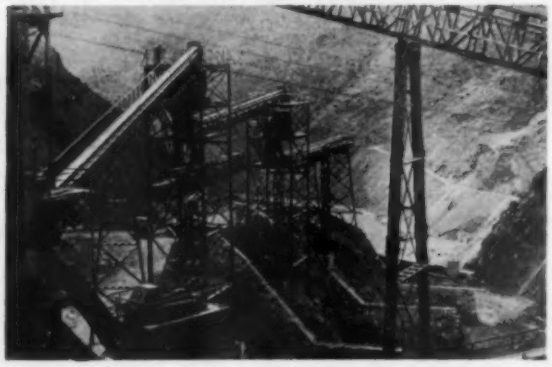
ANYWHERE YOU'LL FIND KENNEDY



MAIN SCREEN HOUSE
SHOWING SAND SIZER AND NO. 38
KENNEDY SECONDARY CRUSHERS
AT SARIYAR DAM, TURKEY

Here's a typical example . . . complete cement manufacturing equipment for SARIYAR DAM, TURKEY. *Another* KVS installation, operating at peak capacity in producing the cement required to build this enormous dam.

Whether the work to be done is in Turkey or Timbuktu, Alaska or South Africa, KVS engineers have designed and installed the *right* equipment. Right in performance . . . right in construction . . . right in quality.



STONE STORAGE—CONVEYORS NO. 3, 4, 5, 6, and 7 WITH TWO 5' x 12' DOUBLE AND TRIPLE DECK "AAA" KENNEDY SIZING SCREENS AT SARIYAR DAM, TURKEY

KENNEDY-VAN SAUN

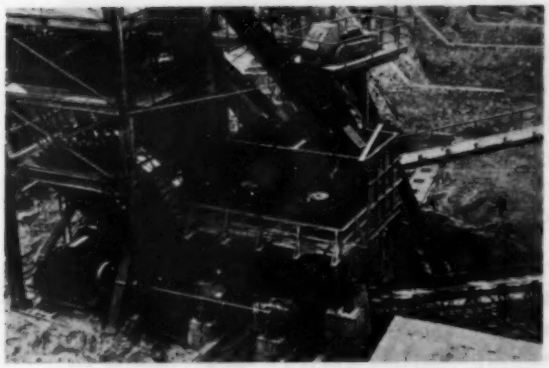
IN THE WORLD...

MACHINERY & EQUIPMENT ON THE JOB

KVS machinery and equipment is in use throughout the world and has established a reputation for economical operation, maximum output and low maintenance cost that has *no* equal!

KVS engineers are available for consultation anywhere in the world. Let us help you solve your cement, lime and crushing problems. Send for bulletins describing KVS machinery and equipment.

48" x 16" KENNEDY STEAM SHOVEL ROCK FEEDER WITH NO. 30 PRIMARY GYRATORY CRUSHER AT SARIYAR DAM, TURKEY



MAIN SCREEN HOUSE AND NO. 38 KENNEDY SECONDARY CRUSHERS AT SARIYAR DAM, TURKEY

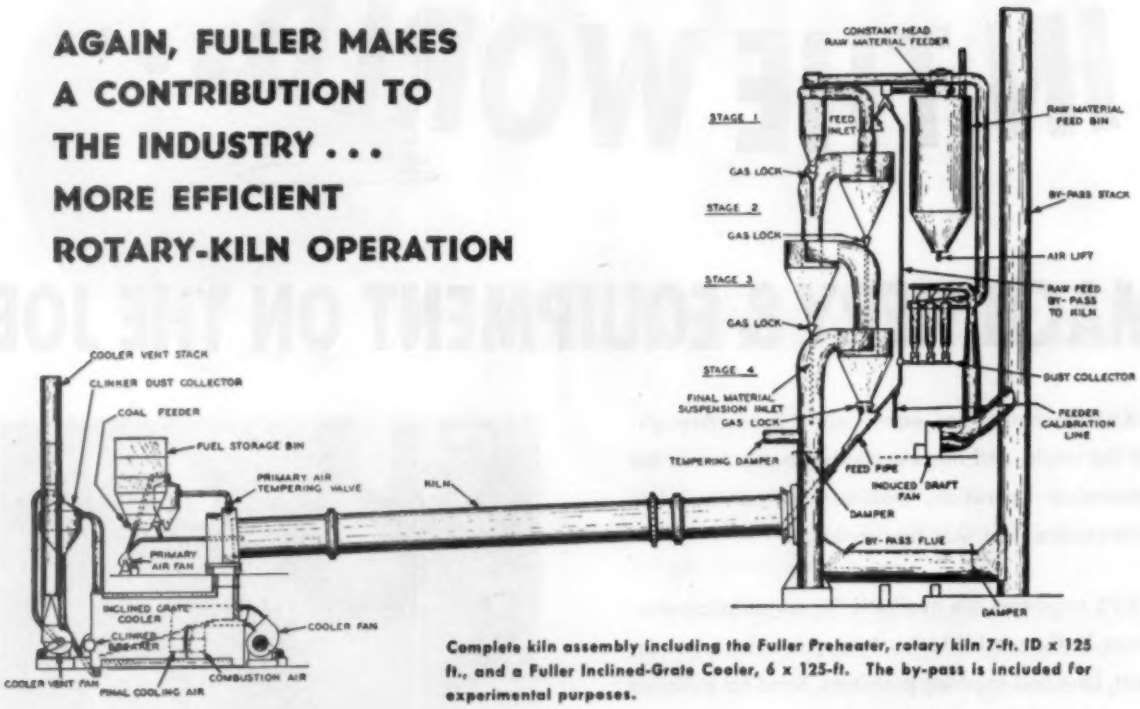
IT COSTS LESS.. TO OWN THE BEST!

MANUFACTURING & ENGINEERING CORPORATION

TWO PARK AVENUE · NEW YORK 16, N. Y. · FACTORY: DANVILLE, PA.

Something new has been added...

AGAIN, FULLER MAKES A CONTRIBUTION TO THE INDUSTRY . . . MORE EFFICIENT ROTARY-KILN OPERATION



Complete kiln assembly including the Fuller Preheater, rotary kiln 7-ft. ID x 125 ft., and a Fuller Inclined-Grate Cooler, 6 x 125-ft. The by-pass is included for experimental purposes.

The latest and one of the most important contributions by Fuller Company to the cement industry since the introduction of the Fuller Inclined-Grate Cooler, is the Fuller Preheater. This equipment, developed and first used in Germany, using a multi-stage suspension process, preheats dry pulverized Portland cement raw materials in rotary kiln waste gases.

Effective use of rotary kiln waste gases to preheat raw materials in the Fuller Preheater has been successfully demonstrated by a full-scale operation in a cement plant in Eastern Pennsylvania. Up to date, orders have been received for three units, by as many different companies.

How it works

Pulverized materials are preheated in suspension in the gas stream in a multi-stage counterflow process, which draws the gases through a series of cyclone collectors. The material is fed counter to the gas flow, suspended in the gas stream, and collected in successive stages until discharged through the kiln-feed pipe. Gas and material contact time is thus prolonged, providing a high degree of heat recuperation with a very low temperature differential between gas and material at the final stage.

What it does

Increases clinker production with relation to kiln volume, with reduction in exit-gas temperatures. Capacity in the first U. S. installation increased from 860 bbl. to 1500 bbl. per day, with a reduction in exit-gas temperatures to between 500°-600°F.

Lowers fuel consumption per barrel of clinker produced. U. S. installation reduced consumption from 1,100,000 Btu to between 650,000 and 700,000 Btu per barrel.

Extends the useful life of many existing short kilns.

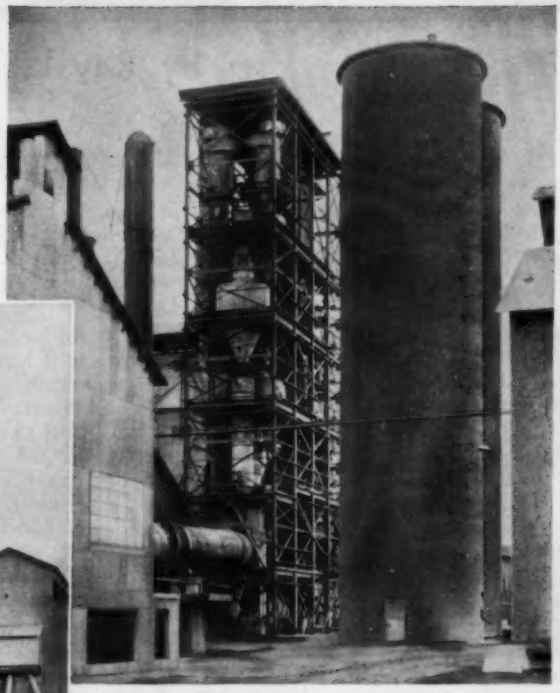
For existing dry-process kilns, the Fuller Preheater is designed so that the only capacity limitation is the practical fuel-burning capacity of the kiln.

FULLER-KINYON, AIRVEYOR, F-H AIRSLIDE, FULLER-FLUXO CONVEYING SYSTEMS . . . FULLER INCLINED-GRATE COOLER . . . DRY PULVERIZED-MATERIAL COOLER . . . ROTARY COMPRESSORS AND VACUUM PUMPS . . ROTARY FEEDERS . . . ROTARY GATE VALVES . . . MATERIAL-LEVEL INDICATORS . . . AERATION UNITS . . SAMPLERS . . . MOTION SAFETY SWITCH

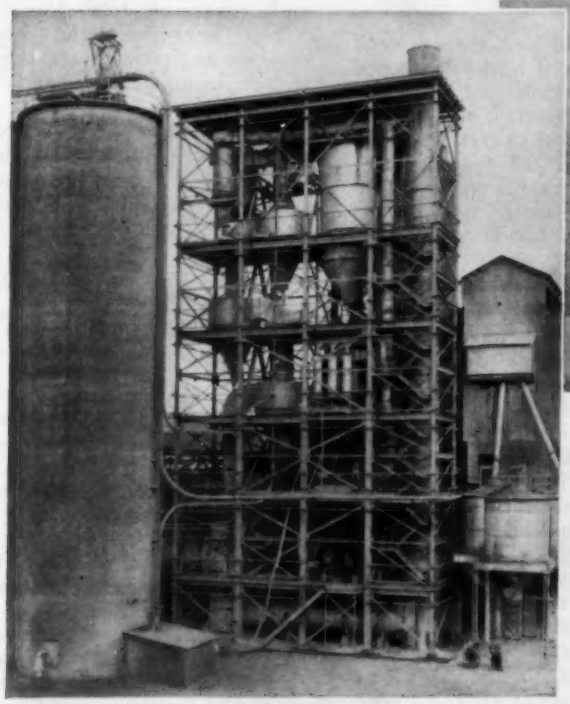
Fuller Preheater

HUMBOLDT SUSPENSION TYPE

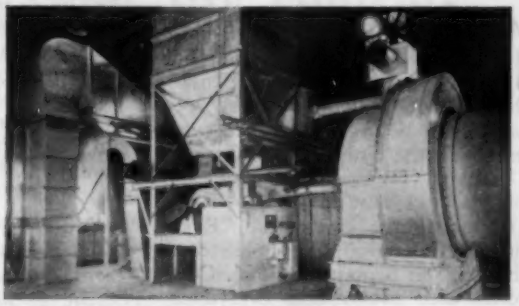
Installation views of first Fuller Preheater installed in the United States, with related equipment.



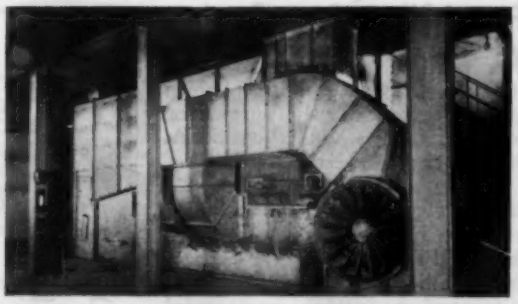
Relation of preheater and supply systems to kiln.



Arrangement of preheater and raw material supply systems.



Fuel supply system.



Fuller clinker cooler, showing branches of cooling air duct, which supply kiln combustion air and final cooling air.

FULLER COMPANY, Catasauqua, Pa.

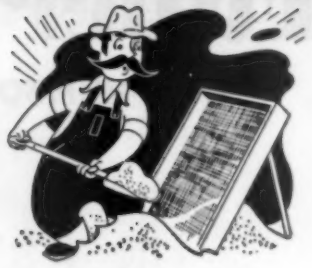
GENERAL AMERICAN TRANSPORTATION CORPORATION SUBSIDIARY

Chicago • San Francisco • Los Angeles • Seattle • Birmingham

FULLER COMPANY GENERAL AMERICAN

PR-1T

Screenings



by Ray L. Smith, Jr.

HELLO, everybody! Believe it or not, we skimmed through New Year's Day without even missing a step on the front porch. It's not possible that any of *you* were red of face come New Year's Day, because of a little thing called overindulgence.

Anyhow, now that the little lad in a three-cornered sarong has followed the genial old boy with the big bulge who just went into the never-never land, it's time for us all to get down to the business of putting *romance* into our business.

What is the Romance of your business? Are you overlooking facts about the building of your company or its products which might help prospects to think well of you? What is there about your product or company which stirs the imagination? Talk about it some day—instead of price, or quality, or service. You might be surprised.

We Pause to Blush

IT's funny how a fellow can live unknown for years and then hit the jackpot. "Gypsum News" is a popular house organ published every month by the United States Gypsum Company, for its employees and friends. And what do you know? The December issue carries the "Egypsum" article originally published on this page in September, 1954. Complete with photo and everything. Isn't fame wonderful?

Cement Mixer—Bang, Bang!

A 15-YEAR-OLD fugitive from a South Carolina reform school fled across the state line in a stolen concrete mixer recently, pursued by dozens of police who finally shot out the tires and captured the youngster.

"I was too scared to stop," said the boy. He had driven the big mixer truck at high speeds for over 65 miles and smashed the rear ends of several police cars which were driven in front of the truck in unsuccessful attempts to stop him.

No one was hurt, although police fired three shots into the cab of the highballing truck.

The lad was charged with assault with a deadly weapon, a truck; reckless driving; failure to stop; driving without an operator's license; and auto larcency.

The kid could have saved himself a lot of trouble if he'd just stepped from the truck at the end of the ride and calmly announced that he was a part-time driver delivering a load of concrete for the nearest police station foundation. Everyone would probably have been quite pleased with his efficient handling of this assignment.

Potpourri and Succotash

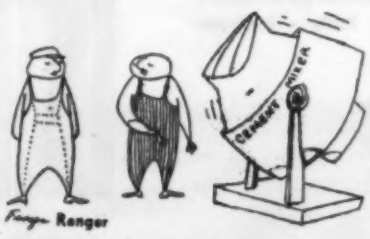
Old Murphy didn't get out of the pit in time when the dynamite was set off, and Murphy was no more. "Too bad," said the foreman. "You'd better go tell his wife about it, John, but for heaven's sake, man, be tactful and break it gently." John rang the Murphy's doorbell, and when a woman appeared he asked politely, "Are you the Widow Murphy?" "My name's Murphy," replied the woman, "but I'm no widow." "Hmm," said John, "You wanna bet?"

Two men, neither very bright, were helping to build a house. One kept picking up nails, looking at them, keeping some, and throwing the others away.

"Why are you throwing away so many nails?" asked his companion.

"Because they are pointed the wrong way. They have the head on the wrong end."

"Idiot! Those are for the other side of the house."



Will you pour?

A little boy talking to his mother on his recent trip to the circus said: "There were tigers and tigeresses, monkeys and monkeyesses, elephants and elephantesses and bears."

Once again we are reminded that words must be assembled with caution. "Want ad: Secretary wants position; no bad habits. Willing to learn."

Hotel Clerk: "I'm sorry, but you can't have room service."

Guest: "Oh, that's all right."

Clerk: "You'll have to make your own bed."

Guest: "That's all right."

Clerk: "You'll find hammer, saw, lumber and nails in the back room."

Then there were the two red corpuscles who loved in vein.

A sarong is a bath towel that found an interesting place to work.

Did you hear about the three little cookies who cried and cried because their mother was a wafer so long?

It's sad for a girl to reach the age
Where men consider her charmless,
But it's worse for a man to attain the age
Where the girls consider him harmless,

Another unsolved mystery is why they put such big holes in Swiss Cheese when it's Limburger that needs the ventilation.

So THERE you are . . . oh, oh, the Boss again . . . He is a man you shouldn't get smart with; you might be a guy he is able to part with.

Got any suggestions for the care and feeding of this department?

Our best to you in 1955—and may every day in it be a happy one.

Experienced inspectors watch every phase of V-C's bag-making operation. Extra care in manufacturing has helped make V-C Bags famous for their toughness and stamina.

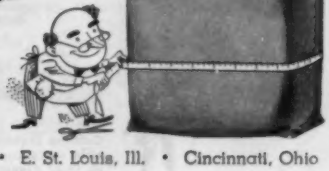
After "tubing," V-C Bags are rigidly inspected for proper seam pasting, length and size. Special care is taken to see that all surfaces are absolutely bonded.

V-C® Quality Controls Mean Better Bags for You

Rigid quality controls, top-grade bagging materials, and careful construction give V-C Multiwall Bags the ability to stand rough treatment. V-C Bags are available in various styles and sizes, two-to-six ply, expertly designed and printed to your specifications in one to four colors. Write for full information, or discuss your bag requirements with a V-C representative.

VC® BAGS

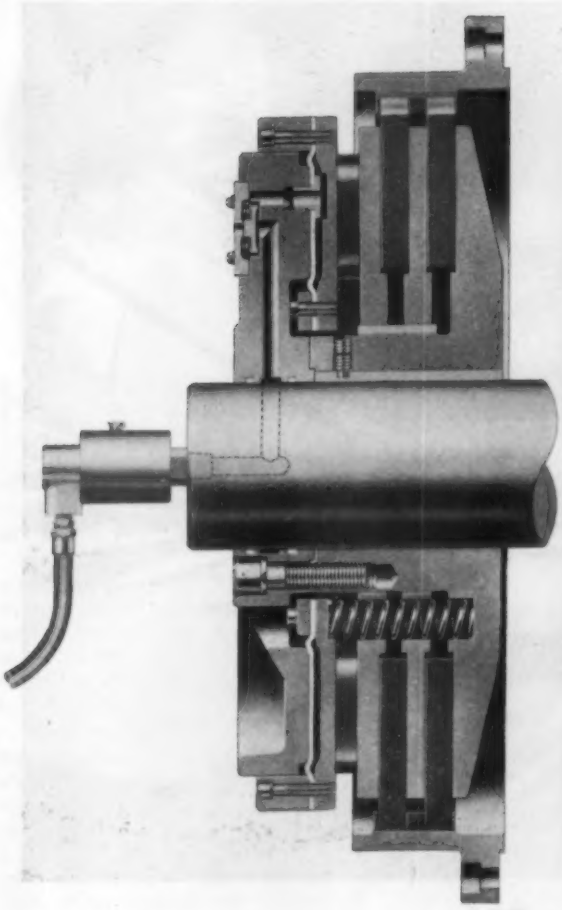
MADE AS CAREFULLY AS YOUR BEST TAILORED SUIT



Virginia-Carolina Chemical Corporation

BAG DIVISION: 9th and Perry Streets, Richmond 5, Virginia

DISTRICT SALES OFFICES: Atlanta, Ga. • Wilmington, N. C. • New York, N. Y. • E. St. Louis, Ill. • Cincinnati, Ohio



DODGE AIR-GRIP CLUTCH

Announcing a NEW Air Clutch with Amazing Sensitivity . . . Cooler Operation . . . Extreme Compactness . . . Built-in Quick Release Valves

Finger tips on the throttle bring instant response, give the operator split-second control. This new product of Dodge is the quickest-acting air clutch available!

New design and engineering by Dodge achieve this exceptional control—in a clutch that provides maximum torque capacity in minimum space. Less air is used to operate the clutch—the result is a new sensitivity that enables the operator to "inch" the clutch, or to throw it into full engagement as required. Where instant disengagement is needed, quick release valves are built into the clutch itself, as optional equipment.

The unique design of the Air-Grip Clutch places the air seal disc at the end *farthest* from the pressure plates, which generate the heat inherent in clutch operation. This, combined with automatic internal ventilation, insures cooler operation and longer life under severest service. Provision is made for mechanical engagement of the clutch if the air supply should fail.

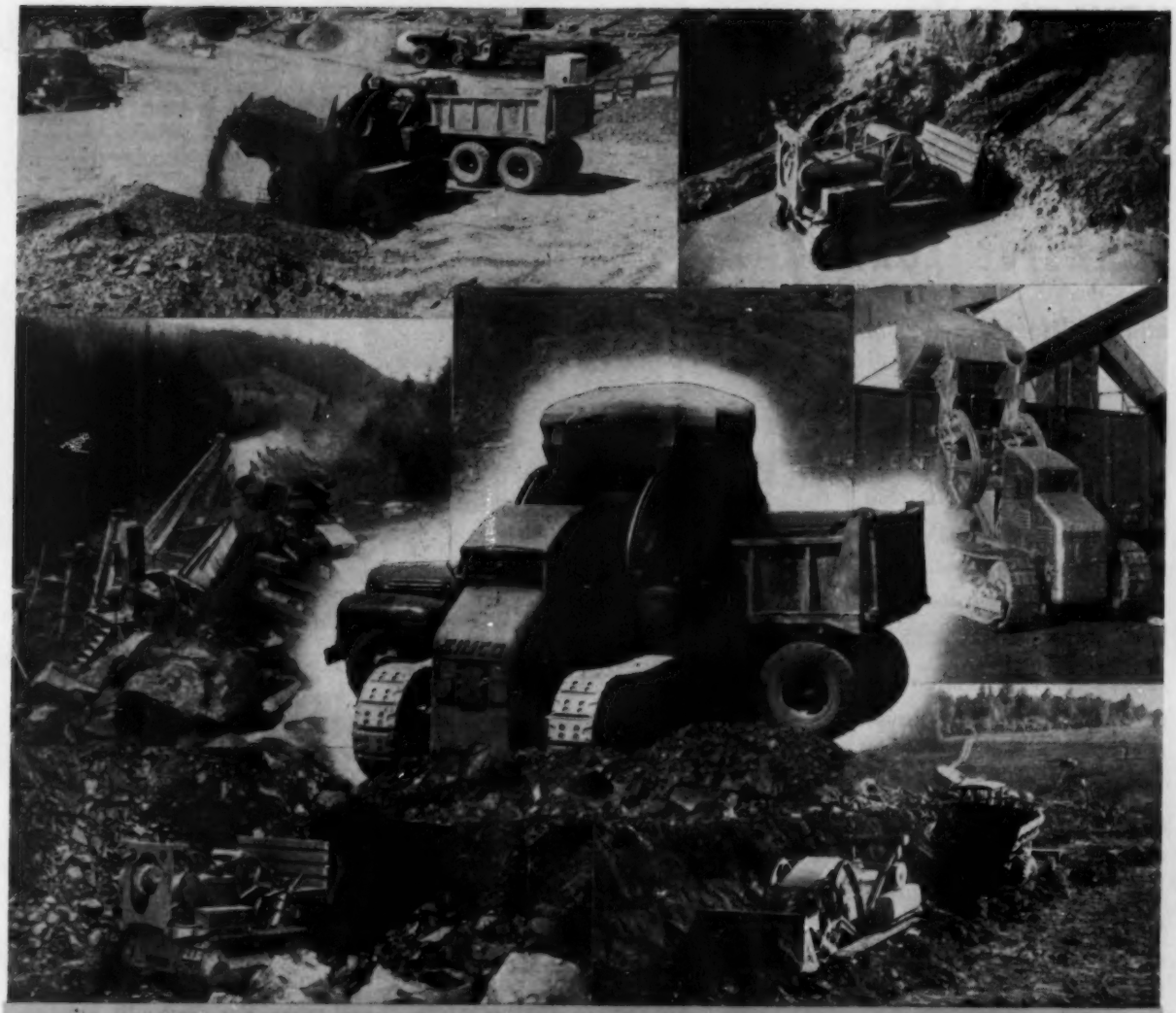
Thorough tests in the field as well as in the laboratory assure you of Dodge dependability in the Air-Grip Clutch. Available in sizes from 8.5 to 460 hp at 100 rpm at 80 psi. Call your local Dodge Distributor or write for Bulletin A634.

DODGE MANUFACTURING CORPORATION
4000 UNION STREET, MISHAWAKA, INDIANA

DODGE
of Mishawaka, Ind.

Sixty years of experience in serving industry's clutch needs . . . manufacturer of the famous Dodge Diamond D and Rolling Grip mechanical clutches.

Call the Transmissioneer, your local Dodge Distributor. Factory trained by Dodge, he can give you valuable assistance on new, cost-saving methods. Look for his name under "Power Transmission Machinery" in your classified telephone directory, or write us.



MATCHED UNITS CUT LOADING COSTS

Eimco 105 Tractors designed to take Eimco loading-excavating attachments provide unbeatable performance in fast, economical loading.

Attachments mounted on conventional tractors cause overloads beyond the designed strength of crawler type equipment, but Eimco 105's are designed and built to take the extra load and vertical thrusts of these attachments. That is why you never hear an Eimco owner talk about track trouble, roller trouble or front idler trouble — the extra strength is built into the machine.

Matched tractor and loader-excavator attachment, both made by Eimco, will dig and load rough material, faster at less cost.

Eimcos are simple to operate, easy to maintain and develop more drawbar pull per horsepower than any other crawler tractor.

Write for complete information.

THE EIMCO CORPORATION

Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

New York, N. Y. Chicago, Ill. San Francisco, Calif. El Paso, Texas Birmingham, Ala. Duluth, Minn. Kellogg, Ida. London, Eng. Paris, France Milan, Italy

Eimco 105

Eimco 105 with bulldozer attachment

HOW TO BUY CONVEYOR BELTS

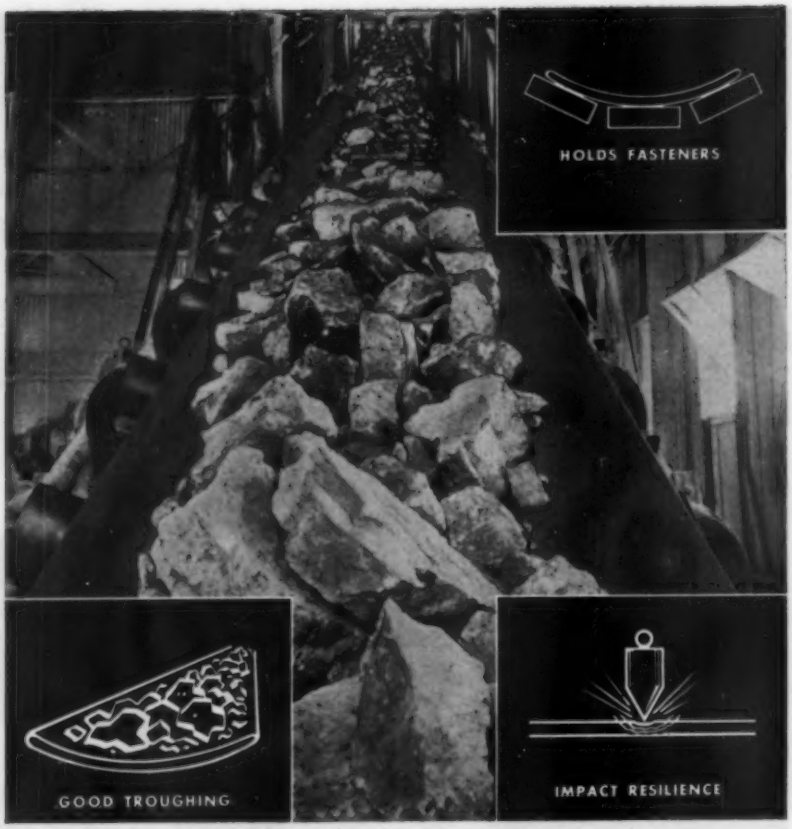
FOR LARGE LUMPS, ABRASIVE LOADS

and get "More Use per Dollar"

Select a belt that assures both maximum flexibility *and* loading impact resistance. One that has high draw-bar strength plus the ability to hold fasteners, and a cover that truly protects and prolongs belt life.

Heavy conventional duck belt constructions fail to provide the needed flexibility and resiliency to absorb heavy loads. They are stiff and "boardy", hard to train on the idlers. Look for a conveyor belt with strength members specially woven to trough easily and cushioned to withstand shock loading. Make certain the belt is moisture and mildew-proof, with protective outer plies and sufficient cover thickness to resist wear and prolong belt life.

Specify by name, the one conveyor belt that offers all these features . . . Ray-Man "F" Conveyor Belt.



RAY-MAN "F" CONVEYOR BELT

This Manhattan conveyor belt combines elastic cushioned inner plies in an outer envelope of strong, yet flexible, synthetic fabric . . . to withstand large, abrasive lumps . . . to permit easy troughability, even where only a thick, narrow belt is used. Special synthetic outer-plies provide maximum elasticity for rounding small pulleys in confined areas. Ray-Man "F" is mildew-proof and, like all Manhattan heavy duty conveyor belts, its service life is greatly prolonged by R/M's exclusive "XDC" Cover which protects it against abrasion, cuts and tears. For unusually abusive shock loading problems you may find extra-cushioned Homocord your best conveyor belt buy . . . or Ray-Man Tension-Master for extra long lifts.

Let an R/M representative help you select the best conveyor belt to meet your job requirement . . . you'll get "More Use per Dollar".

RM-502-AB

RM

MANHATTAN RUBBER DIVISION—PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Brake Linings • Brake Blocks • Clutch Facings Asbestos Textiles • Packings • Engineered Plastic, and Sintered Metal Products • Bowling Balls

LOADING "Nitramon," the safest blasting agent known, in a southern quarry.

For better breakage, with maximum safety . . . use Du Pont "NITRAMON"®

You benefit two ways with "Nitramon" on the job. Here's a blasting agent that hits hard, yet has excellent spreading properties, thus assuring good digging.

Yet with all this power, blasting is safer. Du Pont "Nitramon" is unaffected by flame, friction, sudden shock, or caps—and, when fired with a "Nitramon" Primer, also relatively insensitive, gives the safest combination known for quarry blasting. Both are non-headache-producing and greatly reduce the chance of premature explosions—two reasons why crews throughout the field like to work with them. And "Nitramon" comes in sturdy metal containers that are both watertight and weatherproof.

So test "Nitramon" soon in *your* quarry. You'll be convinced: it's the safest blasting method you can use. For complete information on this and other members of the Du Pont "blasting team": "Nitramon" Primers —Pelletol—and MS Delays—contact the Du Pont man in your district or write: E. I. du Pont de Nemours & Co. (Inc.), Explosives Dept., Wilmington 98, Del.

DU PONT "NITRAMON"

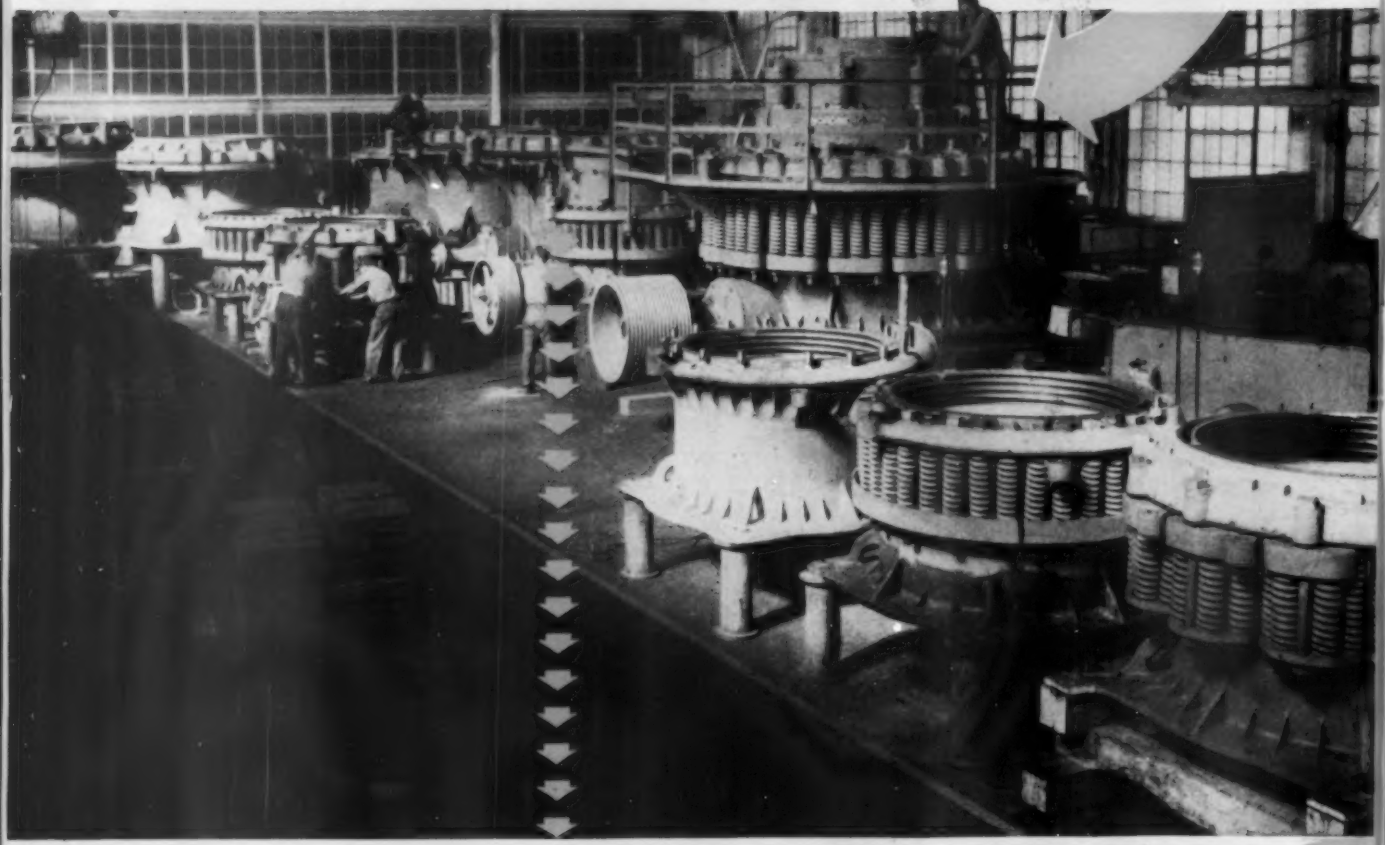
Product of Du Pont Research

DU PONT

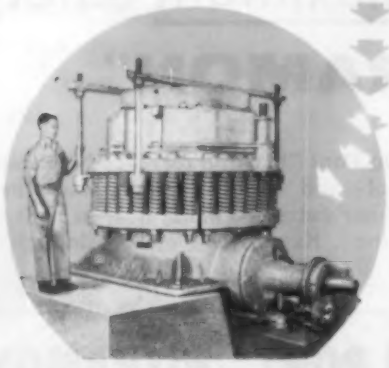
REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

Here's the 5000th SYMONS®



...and here is SYMONS CONE CRUSHER No. 5001... built for one of the world's outstanding Slag Producers



With the 5,000th SYMONS CONE CRUSHER completed, production on Number 5001 was well along . . . a 4' standard crusher scheduled for delivery to one of the world's largest slag producers—who have installed a total of 63 SYMONS CONE CRUSHERS for the dependable, profitable crushing of huge tonnages of slag.

This installation points up the important fact that a large proportion of all SYMONS CONES in service are repeat orders *from satisfied users. For example, here are just a few fields in which SYMONS CONES are used, and the number of repeat orders placed by* single *users in each field:*

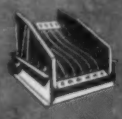
ASBESTOS	18	IRON	32
ABRASIVES	16	LEAD-ZINC	24
CEMENT	6	MOLYBDENUM	18
COPPER	41	NICKEL	28
FELDSPAR	15	NITRATE	11
GOLD	8	REFRACTORIES	12
GRAVEL	18	STONE	39

SYMONS GYRATORY CRUSHERS

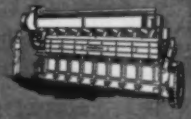
NORDBERG GRINDING MILLS

NORDBERG KILNS AND COOLERS

NORDBERG MINE HOISTS



SYMONS VIBRATING GRIZZLIES AND SCREENS



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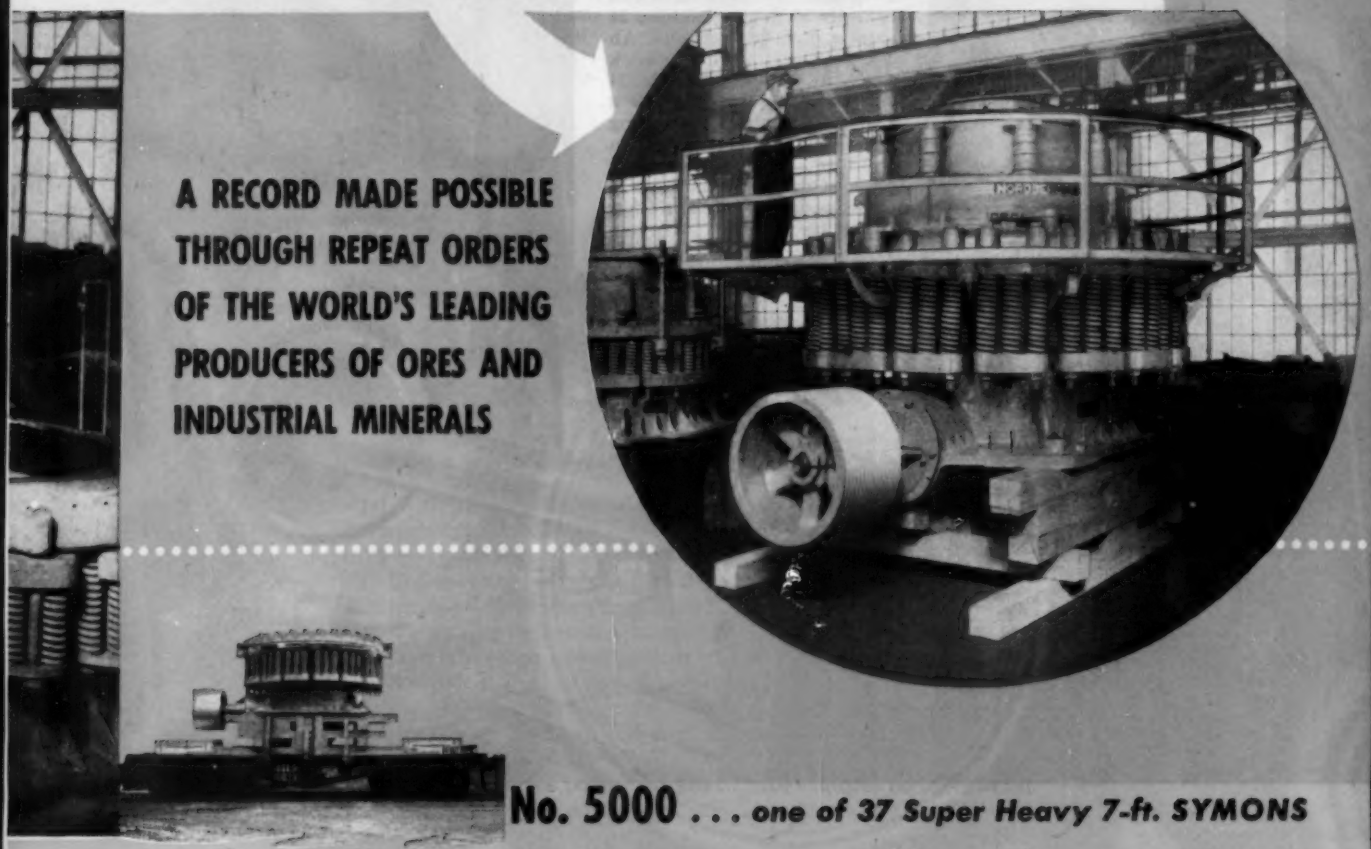
CONE CRUSHER...



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No. 5000 . . . one of 37 Super Heavy 7-ft. SYMONS CONES destined for the Lake Superior Iron Ore Region to process TACONITE

● The introduction of the SYMONS CONE CRUSHER, little more than a quarter of a century ago, marked a new era in fine reduction crushing operations. No other type of crushing machinery ever received such enthusiastic acceptance . . . and today its world-wide use is unparalleled.

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in the famous, one-and-only indoor proving ground!

We batter, smash, twist, jerk and overload axles! Equal the worst possible operating conditions. Then throw in some brutal tricks of our own!

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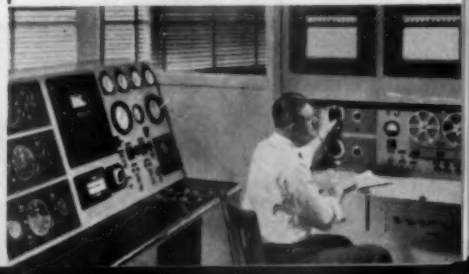
Meet our "Torture Tester"! With graphs showing speed and torque performance under any operating conditions he chooses—with special dials, recorders and electronic devices—he actually *drives* axles with scientific accuracy from his chair!



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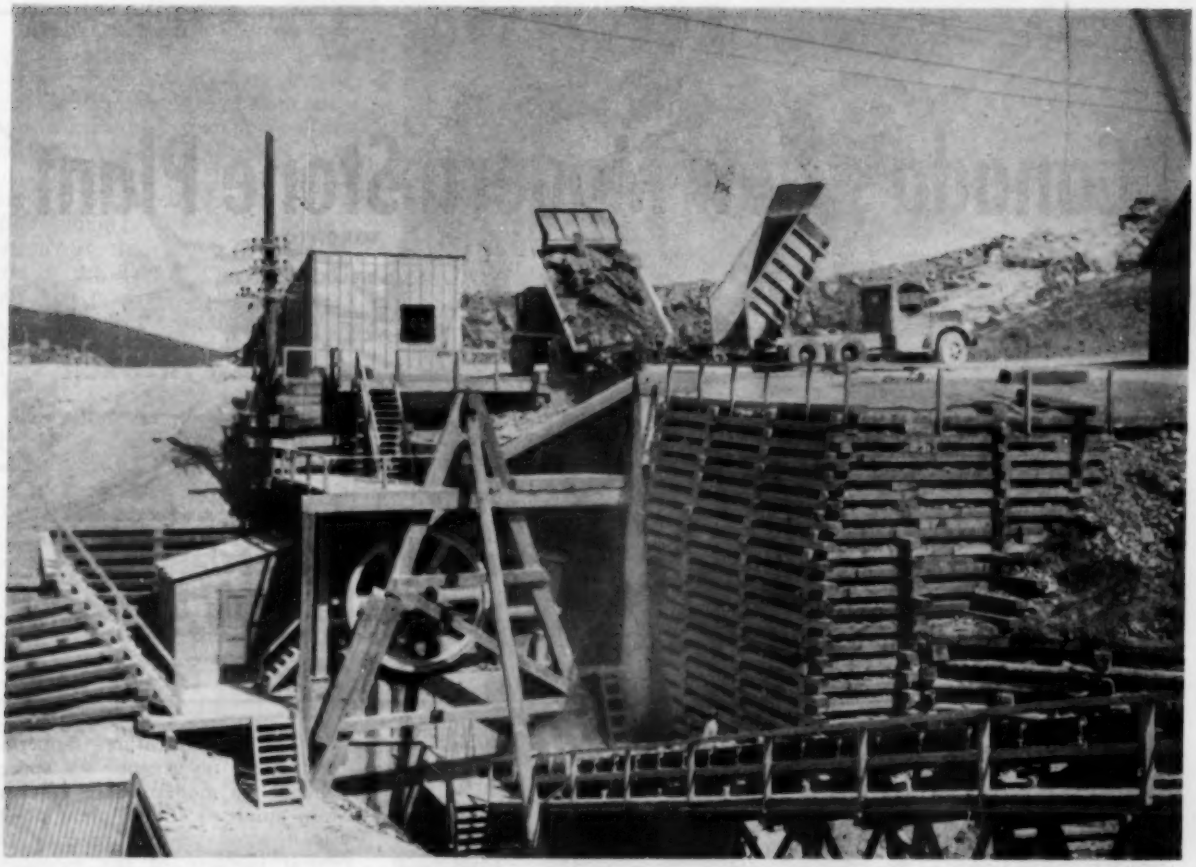

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Canada's New Modern Stone Plant

another ON THE SPOT report

By KENNETH A. GUTSCHICK

"Modern in all respects"—this phrase aptly describes the new limestone quarry operation of Nelson Crushed Stone Ltd., Oakville, Ont., which is one of Canada's newest and outstanding operations. The Nelson firm, a wholly-owned subsidiary of King Paving Company Limited, Oakville, erected the new plant at a quarry site located in a rural area along the edge of the Niagaran escarpment about 15 miles north of Hamilton; production was started in the spring of 1954.

This plant, which has a capacity exceeding 500 t.p.h., was designed according to latest quarrying practices and yet it features numerous innovations; no expense was spared to make it modern and efficient. Main emphasis in the plant design was directed towards meeting the critical problem of the increasing stringency of aggregate specifications. That the problem has been met will be evident from a perusal of this story.

This aerial view depicts the new operation of Nelson Crushed Stone Ltd., located about 15 miles north of Hamilton, Ontario. The minus 5-in. surge pile is on the far left, the secondary crushing plant and screening towers in the middle, and the loading-out bin on the right. Note the extensive use of stockpiles, which are fed by belt stackers. One of the asphalt plants is in the foreground.

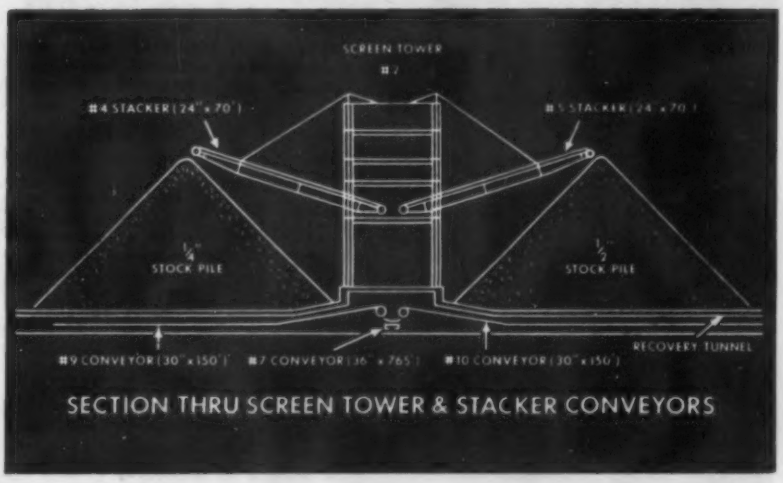
Like many modern crushed stone operations, the Nelson plant is laid out in "ranch type" fashion, permitting the extensive use of both surge and reclaiming stockpiles. Total stockpile capacity exceeds 110,000 tons. Indicative of the sprawling plant layout is the fact that from the beginning of flow at the primary crusher in the quarry floor to the end of the flow at the loading-out bin, the material is belt conveyed a distance of more than 2,000 ft. Actually, a total of more than 3,600 ft. of belt conveyors is used in the plant.

The most noteworthy feature of the Nelson operation concerns the simplicity with which any desired specification stone can be produced. Unlike many quarrying operations of today which utilize elaborate crushing and screening circuits for producing the wide variety of specification stone demanded by consumers, the Nelson operation makes use of simplified circuits to produce several basic stone sizes, all of which are stockpiled over reclaiming tunnels. Basic sizes include the following: 2 in., 1 in., ¾ in., ½ in., ¼ in., screenings and crusher run. In order to obtain the proper size distribution, the basic sizes are later reclaimed in correct proportions on the blending tunnel belt conveyors.

This method not only enables the firm readily to produce virtually any size required, but also reduces the possibility of segregation in stockpiles or bins; that is, there is less likelihood of segregation of material comprising a narrow size range (characteristic of Nelson Stone) rather than a wide size range. Furthermore, by the use of layer loading on the reclaiming belt, there is an *intimate* blending of the various size fractions. It is also possible to maintain production at a feverish pace through use of high-speed, high-capacity belt conveyors.

Perhaps the most unusual feature of the Nelson plant layout involves the reclaiming tunnels themselves. While it is not uncommon for aggregate plants to utilize a single tunnel belt conveyor, the Nelson plant actually incorporates a system of main and lateral tunnels. The main tunnel is 614 ft. long and houses a 36-in. by 775-ft. belt conveyor leading to the loading-out bin structure. One of the lateral units is 300 ft. long and the second lateral is 500 ft. long;

An impressive view of the Nelson quarry and stone plant. The flow begins at the primary crushing station located on the quarry floor and continues to the surge pile, the secondary crusher building, the two screening towers, and finally the loading-out bin.


SCREEN TOWER
#4 STACKER (24" x 70')
#5 STACKER (24" x 70')
¼" STOCK PILE
½" STOCK PILE
#9 CONVEYOR (30" x 150')
#7 CONVEYOR (36" x 765')
#10 CONVEYOR (30" x 150')
RECOVERY TUNNEL
SECTION THRU SCREEN TOWER & STACKER CONVEYORS

Sectional view of one of the screen towers and the adjacent stockpiles. Lateral reclaiming tunnel belt conveyors serving each stockpile lead to a main blending belt conveyor.

This is not a snow scene but a view of the uneven gouged-out bedrock surface — a result of glacial erosion. (The depression in the center is several feet deep.) The clay overburden has been entirely removed, first by dragline, then by hand shoveling and sweeping.

Above: Loading dolomite into a 22-ton heavy-duty truck with a 2½-cu. yd. diesel shovel. Two of the truck-mounted well drills are in background.

Left: Dumping at the primary crusher, which is located in the quarry. Note the signal light (right) used to direct the dumping operation.

Right: The 42-in. gyratory crusher used for primary crushing.

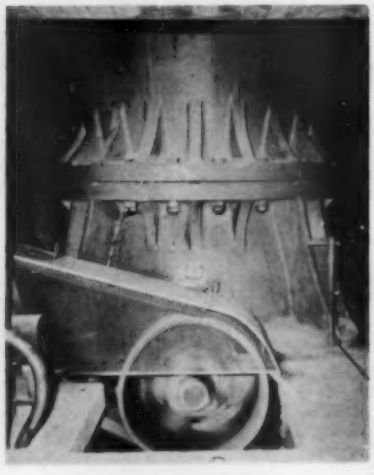
each houses a 30-in. belt conveyor which feeds the main conveyor. (See the accompanying layout drawing for the relationship between the stockpiles and tunnels.)

Another important feature of the Nelson operation concerns the strategic location of the quarry with respect to the major Toronto market, some 50 miles to the east. In view of the paucity of limestone-dolomite deposits around Toronto, the Hamilton area, situated in the prominent Niagaran limestone-dolomite belt,* has long been an important source area for Toronto consumers. Being located near the eastern edge of the Niagaran belt, the Nelson quarry is the closest of the Hamilton district quarries to Toronto, and therefore can benefit by the minimum shipping distance. At present the Nelson firm ships entirely by truck.

Quarrying Operation The quarry, which is located about three miles north of Nelson and one mile west of the Niagaran escarpment, is referred to locally as the Mount Nemo quarry. It was originally opened by the Nelson firm late in 1952, and from that time until the new stone plant started operation early in 1954, the company operated a portable crushing and screening plant at the quarry site. During this period the firm also maintained a smaller quarrying operation in the township of Nelson. When the new plant was started up, the two older production units were taken out of service.

One interesting feature at Mount

*Niagaran (Silurian) rocks outcrop in a circular belt along the flanks of the Michigan structural basin. In Ontario it extends from Niagara Falls westward to the Hamilton district and thence northward to Georgian Bay; the same limestone formation outcrops along the northern and western shores of Lake Michigan, across northeastern Illinois, northern Indiana, and northwestern Ohio. (See map on page 78.)



Nemo concerns the bedrock surface, which is extremely uneven—a direct result of intensive Pleistocene glacial erosion acting upon a massive dolomite bedrock surface. In no one small section is the surface level, and in some places there are pockets gouged out more than 5 ft. below the surface.

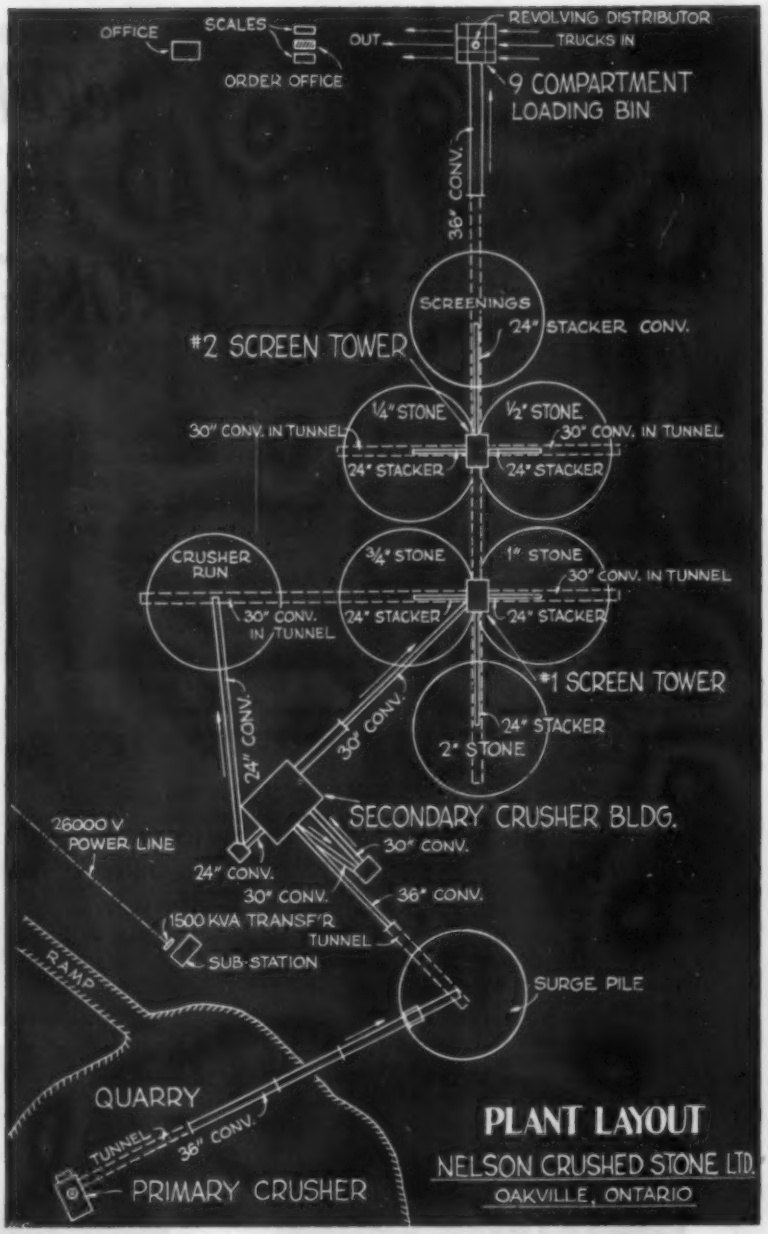
Because of this conspicuous irregularity, stripping and drilling operations are extraordinarily difficult to undertake. The general practice is to strip off as much as possible of the glacial till overburden (which varies from 0 to 10 ft.) with a Koehring 605 dragline loading into dump trucks. Then a labor crew takes over and by means of hand shoveling, scraping, and sweeping, the bedrock surface is stripped clean. Later some of the lowest spots on the rough surface are filled with crushed stone in order to allow the well drills to move in and set up at desired locations.

Hand shoveling of overburden is carried on in order to guard against contamination of the quarried material. This is believed to be somewhat unusual for an aggregate producer, but is not too uncommon for producers of metallurgical and chemical grade limestone, silica sand, and the like. Elimination of clay from the quarry floor also facilitates the various crushing and screening operations.

The Mount Nemo deposit, which is part of the Niagaran formation (middle Silurian age), is a massive- to medium-bedded, gray to buff-colored, dense, high-purity dolomite which contains over 97 percent calcium carbonate-magnesium carbonate. The following is a typical chemical analysis of the quarried dolomite.

Silica	1.41%
Iron oxide	0.77
Alumina	0.15
Lime	30.23
Magnesia	20.82
Carbon dioxide	46.01
Sulphur dioxide	0.103
Phosphorous pentoxide	0.018
Titanium oxide	0.005
Manganese dioxide	0.160
Chlorine	0.053
Calcium carbonate	54.05
Magnesium carbonate	43.58

Presently the quarry is being worked in two levels, but eventually the two levels will be merged, and a single 50-ft. face developed. Primary drilling is handled on contract by a fleet of five truck-mounted Bucyrus-Erie and Bucyrus-Armstrong



Layout of the quarry and stone plant of Nelson Crushed Stone Ltd. This layout is oriented in the same direction as the aerial photo on page 79. Note the symmetry in design of the stockpiles and reclaiming tunnel system.

well drills which put down 6-in. holes. An 18- by 22-ft. drilling pattern will be used for the 50-ft. face. Explosives consist of a combination of C.I.L. (DuPont subsidiary) 40 percent Forcite and 70 percent Dynamix; 4-in. cartridges are used. Both Primacord and electric blasting caps serve to detonate the explosives. To insure scientifically controlled primary blasting, the company subscribes to the Jules Jenkins Vibration Measurement Engineers service—this in spite of the fact that the quarry is located in a rural area where vibration has little or no effect upon surrounding properties.

Two diesel shovels—one a Dominion 450 mounting a 1½-cu. yd. bucket and the other a Northwest 80D mounting a 2½-cu. yd. bucket—are used for quarry loading. (A Koehring 605 1½-cu. yd. machine serves as a spare.) The ¼-mi. haul to the primary crusher is handled by three Euclid 31TD 22-ton trucks and three G.M.C. 890 trucks fitted with Wood bodies. A Caterpillar D8 tractor-bulldozer works on quarry clean-up duty and other operations.

Dempster-Diggster bucket GETS A FULL LOAD WITH EVERY STROKE!

The hydraulic crowd and hoist operation of the new Dempster-Diggster GRD-101 gives you big shovel advantages in front end loading and excavation work. As shown in the at-work photos at right, here's what happens: Dempster-Diggster moves into material with shovel lowered against front of frame. No wheel traction is used to get excavation power. The hydraulic crowd and hoist moves bucket out and up following contour of material—getting a full bucket with every stroke . . . reducing loading time and idle truck time, thus getting the job done faster!

When you put your Dempster-Diggster into operation, one of the first things you will find is that your entire operation must be geared to a faster pace. This means greater efficiency of equipment and manpower—more profit to you!

Write us asking for Folder No. 3116 giving you complete information on the features of the Dempster-Diggster, including TRUCK-SPEED MOBILITY TO AND FROM JOBS . . . AUTOMATIC BUCKET TRIP . . . MAXIMUM DUMPING AND DIGGING HEIGHT . . . MINIMUM TURNING RADIUS . . . THE SHOVEL WITH TORQUE CONVERTER . . . HYDRAULIC STEERING, etc. Manufactured by Dempster Brothers, Inc.

In photo below camera catches Dempster-Diggster ready to back off and move up to a truck for loading.

DEMPSTER DIGGSTER

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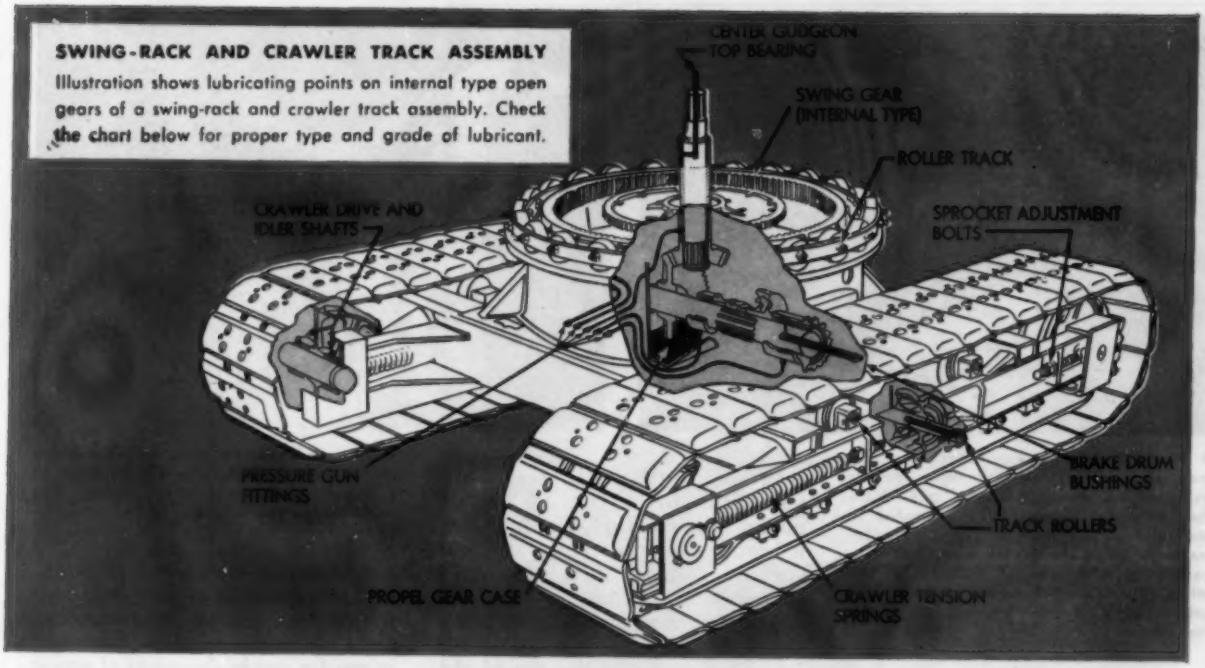
SWING-RACK AND CRAWLER TRACK ASSEMBLY
Illustration shows lubricating points on internal type open gears of a swing-rack and crawler track assembly. Check the chart below for proper type and grade of lubricant.
CENTER GUDGEON TOP BEARING
SWING GEAR (INTERNAL TYPE)
ROLLER TRACK
SPROCKET ADJUSTMENT BOLTS
CRAWLER DRIVE AND IDLER SHAFTS
PRESSURE GUN FITTINGS
BRAKE DRUM BUSHINGS
TRACK ROLLERS
PROPEL GEAR CASE
CRAWLER TENSION SPRINGS

Where, how and with what to lubricate?

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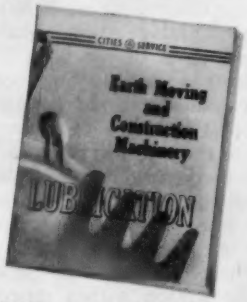

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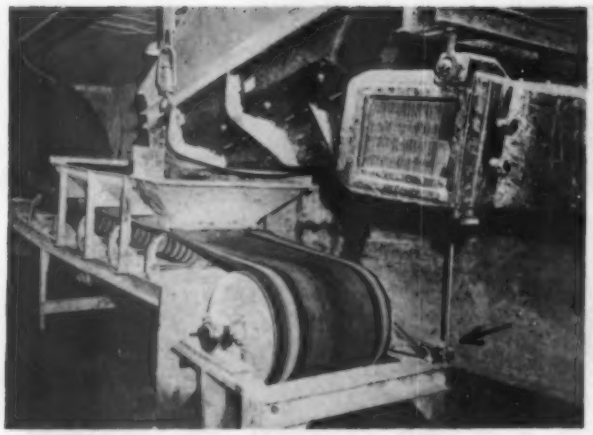
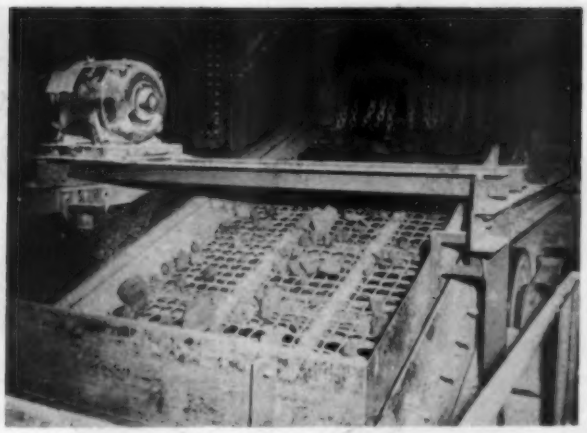
LUBRICATION OF SWING-RACK AND CRAWLER MECHANISM

Part or Unit	How Lubricated	Lubricant Recommended	Grade No. 0°F. to 32°F.	Grade No. Above 32°F.
CRAWLER MECHANISM— Track rollers, idlers, track wheels, etc.				
Oliver:	Track Wheel System	Trojan Gear Oil	#90	#140
Allis-Chalmers:	Positive Seal Units	Trojan Grease	P-0	P-0
Others—				
Grease Lubricated:	Pressure gun fittings	Trojan Grease	A-0	A-1
	Pressure gun fittings	Trojan Grease	F-3-0	F-2-0
Oil Lubricated:	Hand gun or other means	Trojan Gear Oil	#90	#90 to #250
GEAR DRIVES—				
Open: Normal Condition	By brush or other means	Cisco Compound	#3-Z	#5-Z
Dusty Condition	By brush or bath	Raven Oil	#3	#7
Enclosed:	Bath	Trojan Gear Oil	#90	#140



A 48- by 72-in. vibrating feeder is used to feed the primary belt conveyor leading from the quarry to the surge pile. Note the centrifugal switch (arrow) mounted to the right of the tail pulley, which automatically stops the feeder when belt slippage exceeds 5 percent. When the belt returns to its normal speed, the feeder is automatically started up again. Note also the rubber impact idlers.



A view of the 6- by 14-ft. 2-deck scalping screen, which rejects plus 2¾-in. stone to a 5½-ft. (secondary) cone crusher. The other screen products are further sized.

Primary Crusher The primary crusher station is located on the first quarry level, about 35 ft. below the quarry surface; it houses a Traylor Bulldog 42-in. gyratory crusher, which is driven by a 250-hp. English Electric induction motor. Provision is made to dump quarry loads from two sides. Two electric hoists serve the crusher; one is a 50-ton unit used for crusher maintenance and the other a 2½-ton unit used for hung-up blocks. Dumping into the crusher is directed by a signal light projecting from the corner of the station within range of the driver's vision. (See photo on page 80).

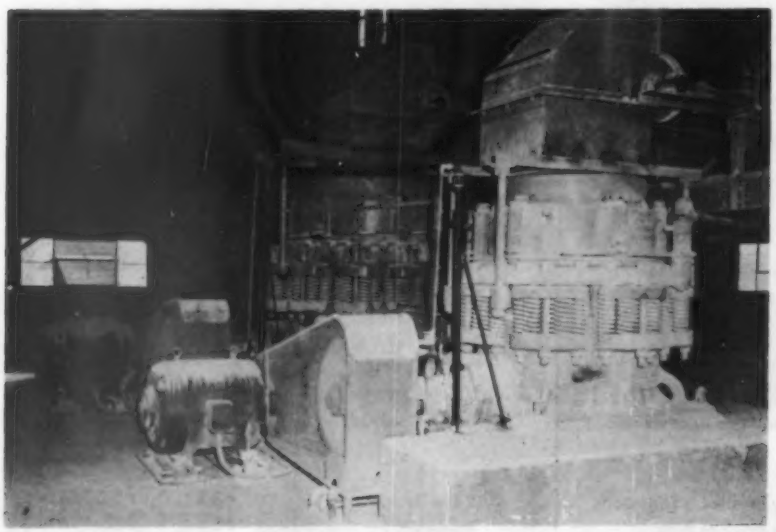
Crusher lubrication is handled automatically by a pair of electric pumps (one standby). The lubricant is kept at uniform temperature and viscosity by means of thermostatically-controlled electric heaters. To counteract the possibility of oil pump failure, the firm has installed a 150-gal. oil reservoir at the top of the crusher station structure; the oil is held in the tank by a check valve. When the pressure in the oil line drops sharply (due to pump failure) the tank supply is immediately fed by gravity to the crusher. The oil supply is adequate to enable the crusher to run about 5 to 10 minutes (long enough to be emptied), thus preventing any damage to the crusher itself.

Other interesting features at the primary crushing station include an automatic alarm system to warn the crusher operator of overheating of the crusher and a dust collector fan which vents the dust generated at the crusher to atmosphere. This station also has twin electric float-controlled 4-in. pumps (one standby) and one 4-in. gasoline deep well pump for use in the event of power failure.

The primary station was designed to have about twice the capacity of the remainder of the plant. This was done so that one-shift production of the primary crusher would supply enough stone to the surge pile for two-shift secondary crushing and later operations. At the present time the entire plant is being operated on a one-shift basis; but if and when the need arises, it will be operated according to original design.

The primary crusher product (minus 5-in.) is discharged into an equalizer bin and then fed *via* a Syntron 48- by 72-in. vibrating feeder to the No. 1 (36-in. by 475-ft.) belt conveyor, which in turn leads out of the quarry to a 10,000-ton surge pile. The first 150 ft. of the conveyor is housed in a concrete tunnel, the remainder in a gallery covered with corrugated steel sheathing. The drive for the conveyor is a 100-hp. motor direct-coupled to a double reduction helical gear reducer, and is complete with an automatic clutch and backstop; the drive mechanism is housed in the principal supporting tower of the conveyor, located about 75 ft. back from the conveyor head pulley.

The equalizer bin mentioned above, which has a capacity of about 50 tons, was installed to eliminate surges on the No. 1 conveyor. The vibrating feeder draining the bin is set a little above the average production rate by means of a rheostat. The level of the bin, of course, fluctuates according to rate of truck



Tertiary reduction is handled by a 3-ft. cone crusher (front) and a 4¼-ft. cone crusher, both of which discharge to the No. 5 (36-in. by 325-ft.) belt conveyor.

dumping at the crusher, but normally it is never emptied completely.

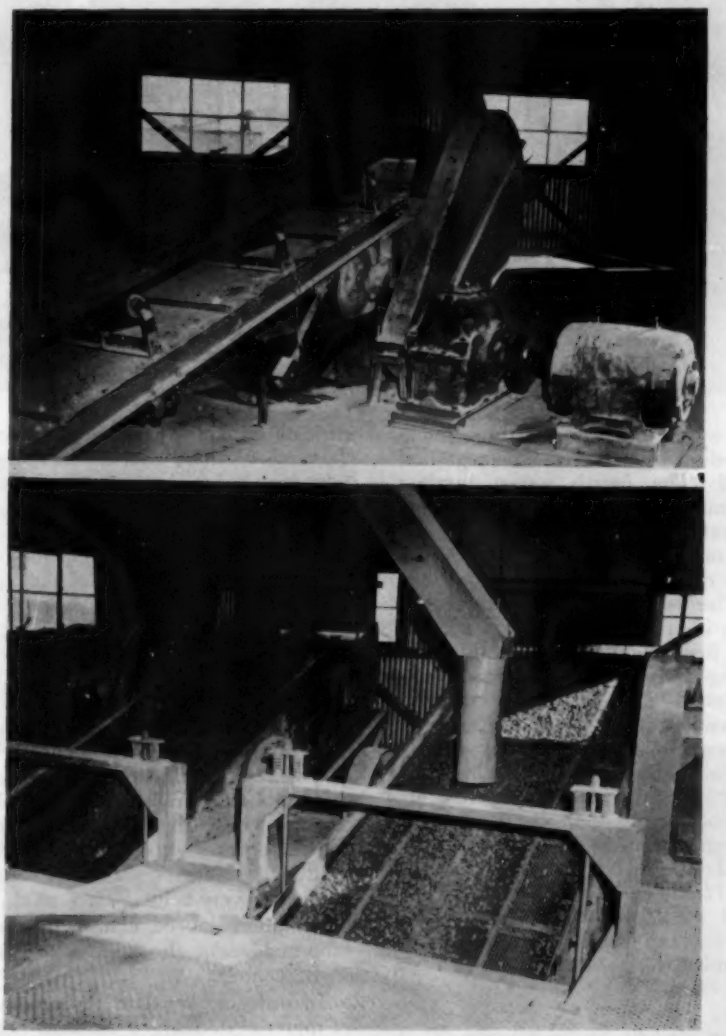
To counteract belt slippage on the primary belt conveyor, Nelson has installed a centrifugal switch at the conveyor tail pulley. When the belt speed (normally at 275 f.p.m.) is reduced as much as 5 percent due to slippage, the centrifugal switch automatically stops the Syntron feeder until the belt returns to its normal speed, and an alarm sounds during this feeder shutoff. This device is particularly applicable during wet weather.

Secondary Crusher Bldg. Material is reclaimed from the surge pile by a pair of Syntron 48- by 72-in. vibrating feeders, which discharge to the No. 2 (36-in. by 275-ft.) belt conveyor. This conveyor, like the No. 1 unit, is housed first in a concrete tunnel, then in an inclined conveyor gallery. At the secondary crusher building, which contains three vibrating screens and three cone crushers, the stone is first scalped on a Tyler F800 6- by 14-ft. 2-deck screen; the top deck is fitted with 2¾-in. wire cloth openings and the bottom deck with one section of ⅝-in. openings and one section of 1¼-in. openings. Oversize from the screen is chuted to a Symons 5½-ft. standard cone crusher for secondary reduction; this unit is driven by an English Electric 200-hp. induction motor. The crusher throughs are then returned to the crusher building for further screening by a two stage 30-in belt conveyor (No. 2 and No. 3). Rejects off the bottom deck of the scalping screen can either join with the secondary crusher product and then be returned for further screening or be carried to Screening Tower No. 1 *via* the No. 5 (36-in. by 325-ft.) belt conveyor.

There is also flexibility in the disposition of the screen throughs, made possible by means of a flop gate arrangement. All or any portion of the minus 1¼ in. and minus ⅝-in. material can be chuted to the No. 5 conveyor (and thus undergo further screening) or be carried on the No. 13 (24-in. by 260-ft.) stacker conveyor to the crusher run stockpile.

Secondary screening is handled by a pair of Tyler F600 5- by 14-ft. 2-deck screens, operated in open circuit with a Symons 4¼-ft. standard cone crusher and a Symons 3-ft. shorthead cone crusher. The top deck has 2¾-in. openings, and the bottom deck has sections of 1-in. and 1¾-in. openings, respectively.

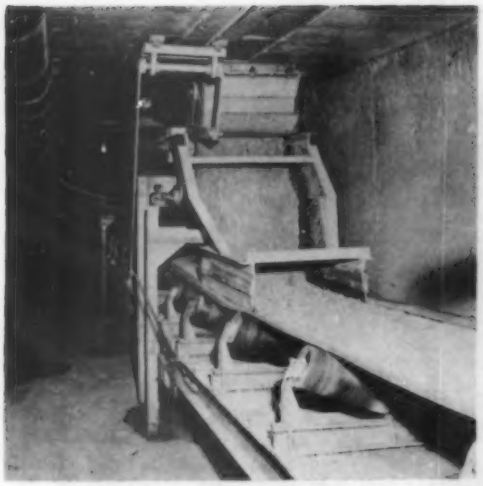
HERE IS AN IDEA



These two views were taken on successive floors of Screening Tower No. 2. The top view shows the 36-in. conveyor belt feed to the two 5- by 14-ft. 2-deck finish screens, which are shown on the floor below. An interesting feature at this point is the hopper installed beneath the special return pulley of the conveyor. Fine material adhering to the belt is automatically scraped off at the pulley, collected in the hopper, and then chuted to the screen below, thereby materially reducing spillage. A similar installation is used at Screening Tower No. 1.

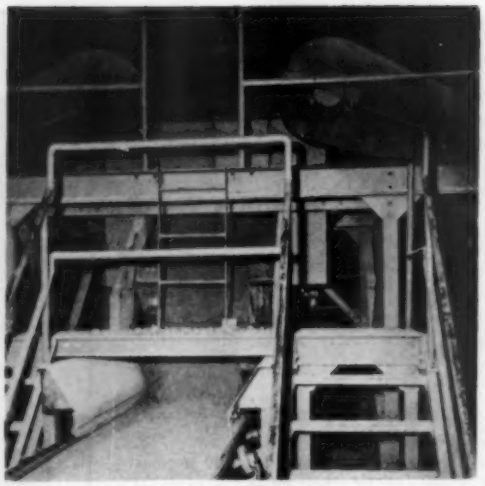
The larger of the two tertiary crushers handles rejects off the top deck, and when a greater tonnage of fine products is required, rejects off the bottom deck. The 3-ft. cone, on the other hand, recrushes the minus 1¾-in. material, although provision is made to bypass this crusher whenever necessary. The screen throughs and all of the crusher throughs are then collected on the No. 5 conveyor and carried to Screening Tower No. 1. To increase the production of fines, provision has been made in the crusher building to install a third cone crusher.

Screening Towers Production of the first three basic sizes made at Nelson are carried out at Screen Tower No. 1 by means of a pair of Dillon 5- by 14-ft. 3-deck screens, each of which is fitted with 1¾-in., 1-in. and ⅝-in. decks, respectively. Finished products include 2-in., 1-in. and ¾-in. stone, each delivered to stockpile by stacker conveyors. The No. 1 stacker, handling the 2-in. stone, is an enclosed 24-in. by 125-ft. conveyor supported on bents. The No. 2 and 3 stackers are identical 24-in. by 70-ft. conveyors, which are suspended from



Left: A typical reclaiming tunnel scene, showing a clamshell gate and counterbalanced chute discharging material to a 30-in. belt. Note the ventilation tube along ceiling.

Right: The main 36-in. tunnel belt conveyor, with two lateral conveyors feeding to it. When this photo was taken, three basic stone sizes were being blended on the main delivery belt.



the tower. Each of the three stackers discharges 50 ft. above ground level. The fourth screen product (minus ⅝-in.) is transferred to Screen Tower No. 2 for further sizing on the No. 6 (30-in. by 150-ft.) belt conveyor.

The second screening tower station is practically a carbon copy of the first, the only major difference being that two 2-deck screens (also Dillon 5- by 14-ft. units) are used instead of two 3-deck units. These screens are fitted with decks having ⅜-in. and 3/16-in. openings, respectively; they produce ½-in. stone, ¼-in. stone, and screenings. The screenings stacker (No. 6) is identical to the No. 1 stacker (24-in. by 125-ft. and supported on bents), and the ¼-in. and ½-in. stackers (No. 4 and No. 5, respectively) are identical to stackers No. 2 and No. 3 (24-in. by 70-ft. and suspended from the screening tower). Each of these stackers also discharges 50 ft. above ground level.

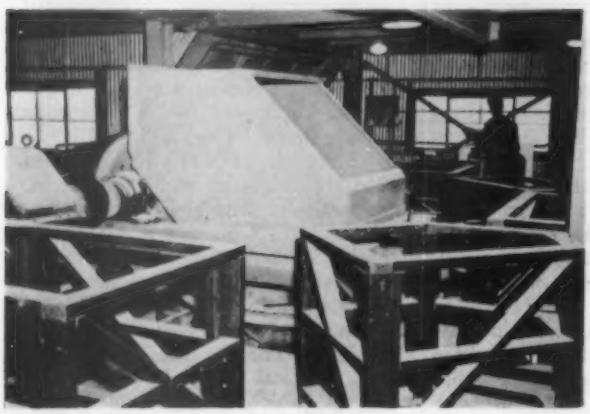
Reclaiming Tunnels As mentioned in the introduction, one outstanding feature of the Nelson plant concerns the use of an intricate system of stockpiles and reclaiming tunnels used in blending aggregates. Materials from both the 2-in. and screenings stockpiles are discharged directly onto the main tunnel belt conveyor, while 150-ft. lateral tunnels serve each of the ¼-in., ½-in., and 1-in. stockpiles. A fourth lateral tunnel (350 ft. long) serves the crusher run and ¾-in. stockpiles. Each pair of lateral tunnel belt conveyors discharges into a collecting box mounted over the main tunnel belt conveyor; thus it is possible to draw out material simultaneously from any stockpile and feed it to the main belt. This system permits the production of virtually any blend required. Discharge to the recovery belts is *via* a total of 67 counterbalanced clamshell gates mounted under the piles, spaced at 14-ft. centers.

In order to regulate the amount of material discharged onto the belt, the gate openings can be infinitely adjusted. This arrangement is essential to produce the various blends required.

Each tunnel, built of concrete, measures 7 ft. 3 in. by 7 ft. 3 in. in cross section. Tunnel construction was especially difficult since the bedrock had to be blasted out along the entire tunnel course. To insure adequate ventilation in the recovery tunnels, the firm has installed a conventional mine ventilation system.

Truck loading is handled at a central loading-out station, which consists of a nine-compartment bin arranged in a 3 by 3 pattern; total bin capacity is 900 tons. The feed is transferred to each compartment from the main 36-in. by 775-ft. delivery belt by means of a pivoted distributor, which is operated by cable control from the bin platform. A Lokator mine signal system is used to direct the flow of material to the bin; the operator simply rings the proper signal, and the tunnel man loads from the proper stockpile or stockpiles.

A final impressive feature of the Nelson plant involves the truck-loading operation. Never before has the writer observed such speed in this phase of production. Fifteen seconds for a 15-ton load is typical—or an average of 1 ton per second! This high speed is possible because (1) *two* clamshell gates, rather than one, are used to drain each compartment; and (2) an intricate lever system is used to open the gates, permitting one man to handle all truck loading. There are six gate lever stations, three to each of the loading platforms. Three of the stations have four levers each, permitting the operator to load from two compartments without moving his position. The three other stations have six levers each, allowing the operator to load from three compartments without changing position. Thus the movement of the loader is reduced to the minimum.



The revolving distributor which serves the loading-out bin. In the background is the bin loader, who makes use of a mine signal system to direct the flow of material from the reclaiming tunnel to the bin.

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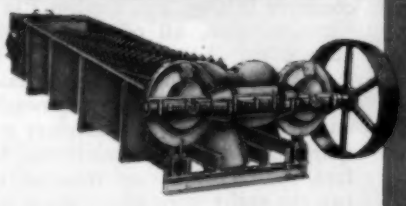
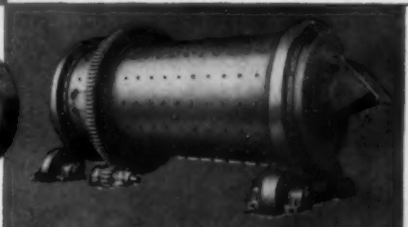
All Steel Rockmaster Single Roll Crusher for primary or secondary work on shovel loaded rock and ore.

A pioneer in the development of many types of processing equipment, McLanahan has served domestic and foreign pits, mines and quarries for more than a century. Shown on this page are a few illustrations of McLanahan equipment for crushing, washing, sizing and conveying all types of ore, coal and rock. Technical details and price information will be sent upon request.



Log Washer for removing tough clay and soft rock from various materials.

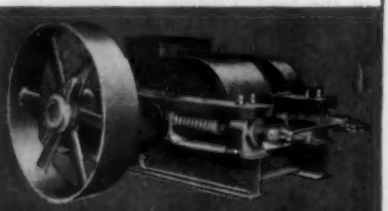


Steel Paddle Mill Scrubber—high capacity for cleaning large size feed.

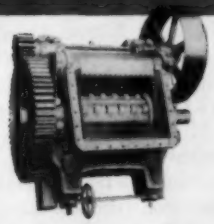
Heavy Duty Reciprocating Plate Feeder. Handles any material from sand sizes to shovel loaded rock and ore.

Live roll Grizzly for sizing and feeding various products.

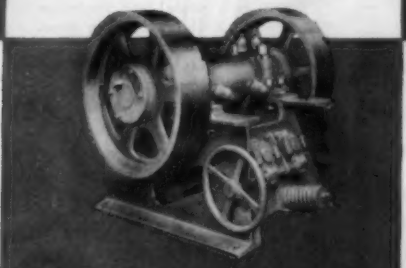
Double duty combination Scrubber and Sizing Screen for large and small capacities.



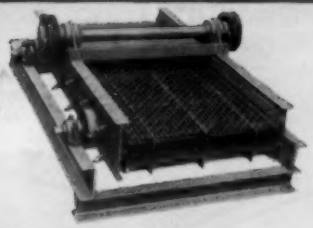
Heavy Duty Fabricated Block Diamond Double Roll Crusher for secondary reduction.



Automatic Steelstrut Crusher for primary and secondary work in small plants.



Fabricated Jaw Crusher for primary and secondary work.



Single and Double Deck Vibrating Screens in different sizes.

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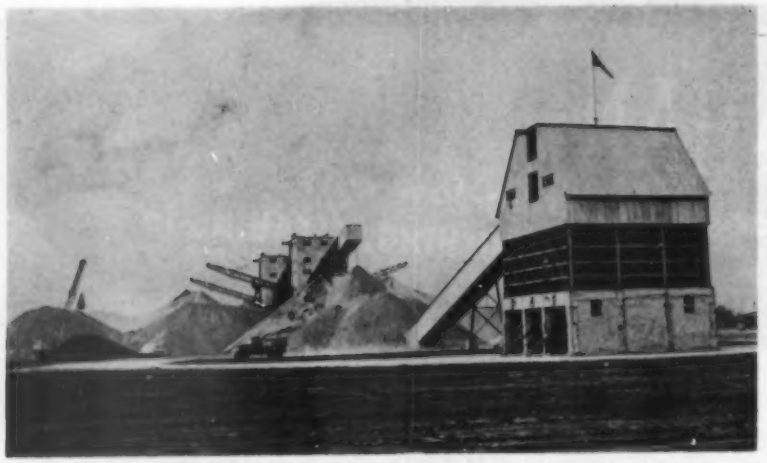


All material is brought up from the reclaiming tunnel to this 9-compartment bin for truck loading; bin capacity totals 900 tons.

The truck-weighing operation is somewhat unusual in that two truck scales are used—one to weigh in the truck empty and the other the loaded truck. Fairbanks Morse 50-ton capacity Print-O-Matic scales are used; the scale platforms measure 10 by 50 ft. The first scale automatically records the tare weight, type of aggregate (by symbol), date, and time, and the second scale automatically records the gross weight of the load. Orders are transmitted from the quarry office to the scale house *via* an intercommunications system.

Nelson's new plant was designed by R. M. Scrivener, consulting engineer, Toronto, who is one of Canada's leading consultants in the quarrying field; officials of the Nelson firm collaborated on the design. Steel for the plant structures and conveyor frames was prefabricated by the Central Bridge Company, Trenton, Ont., and Canada Electric Company, Ltd., Toronto, contracted the electrical work. The entire plant was built by the Nelson firm.

All of the conveyors, which were built with Link-Belt pulleys and idlers, are equipped with automatic clutches and backstops, and are interlocked electrically with the major processing units. Conveyor drives consist of either Hamilton Gear and Machine Company helical gear reducers or Link Belt motorized reducers. Stacker conveyors No. 1 and No. 6 (the 125-ft. units) are equipped with head pulley drives, whereas each of the stacker conveyors No. 2, No. 3, No. 4, and No. 5 (the suspended 70-ft. conveyors) is equipped with a drive pulley located near the conveyor tail end in the stacker tower. The stacker drives were designed in this manner mainly in order to cut down the weight of the suspended stackers and to keep the drives under cover. All of the conveyors, with the exception of the suspended conveyors, have gravity take-ups. Gutta Percha & Rubber Ltd., Toronto, supplied all of the conveyor belting, and English Electric Co., Ltd., all of the electric motors.

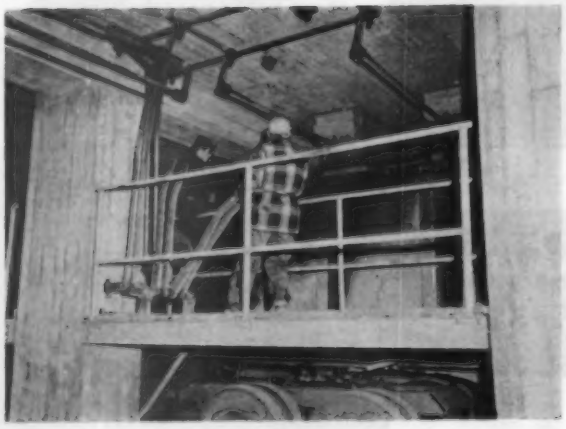
Because the plant is efficiently laid out and operations are as nearly automatic as possible, manpower requirements are at the minimum. In fact, only 12 men are required to run the entire stone plant; these include three men at the primary crushing station and surge pile, two at the secondary crusher building, one at the two screening towers, two men in the recovery tunnels, one at the top of the loading-out bin, one on truck loading, and two in the scale house.

Two-way radio is used to a limited extent by the Nelson firm, the sets being installed at the stone plant office and in the cars of the superintendent and salesmen. The radio sets, 10-watt units, were supplied by General Electric.

Officers of Nelson Crushed Stone Ltd. are W. W. King, president, J. N. Langman, vice-president, A. B. Lankin, secretary-treasurer, and W.G.M. King, director. H. G. Wilson is general manager, and J. A. Prince is superintendent. M. Dave Boyd is assistant construction manager.

King Paving Co. Ltd., Oakville, the parent company, is a major Ontario contracting company, specializing in highway and airport construction. Another affiliate is the King Building Materials Ltd. at Oakville, which operates a ready-mix plant and building supply yard. King Paving also has two asphalt plants set up at the Mount Nemo quarry, one being a Hetherington Berner PA30 1½-ton batch plant and the other a Pioneer Model 101 Continuflo 150 t.p.h. plant.

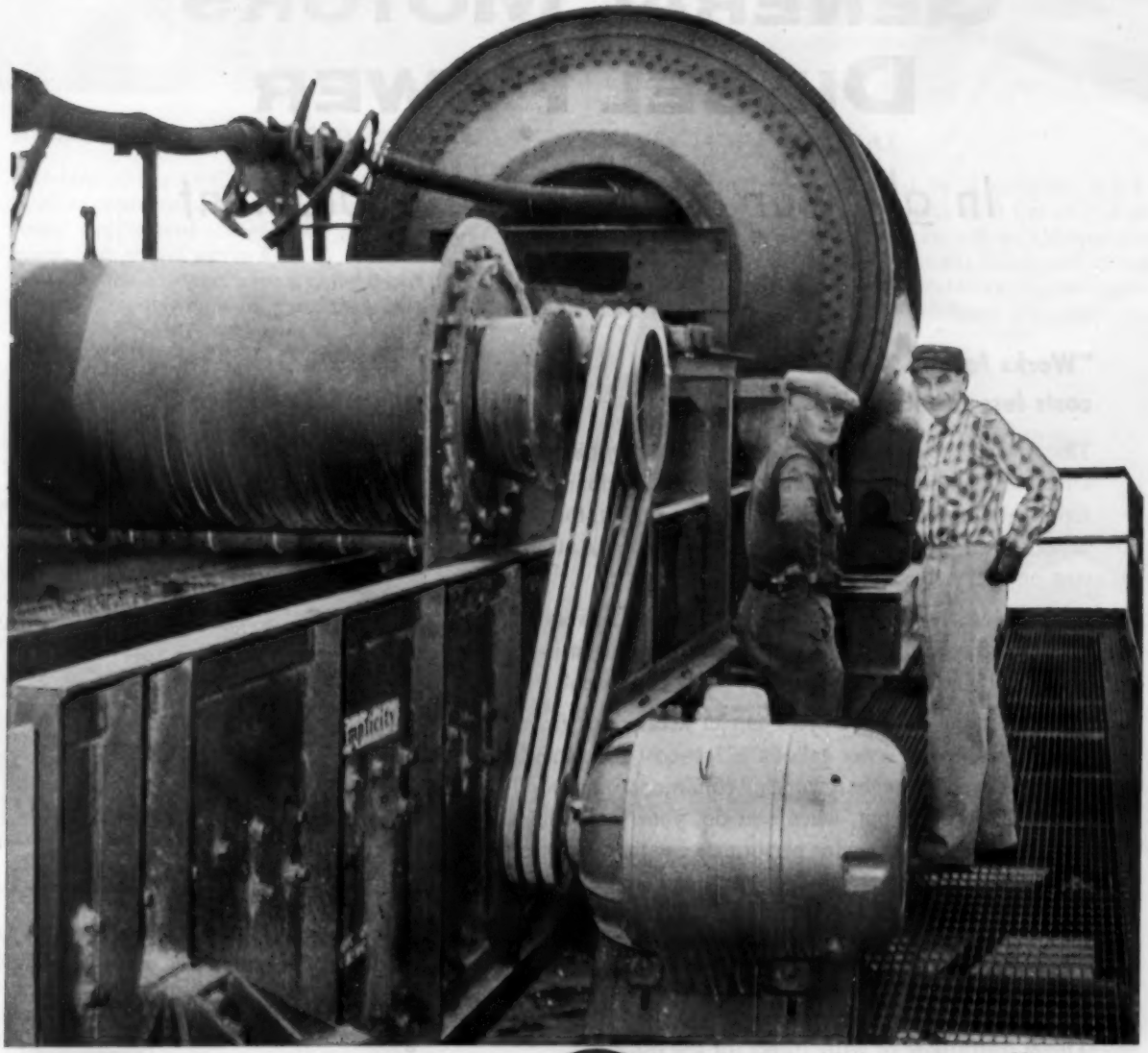
Two 50-ton truck scales are used—one for getting the truck tare weight (right scale) and the other (left) for the gross weight; shipping tickets are stamped automatically.



Trucks are loaded at the amazing rate of one ton per second; the use of two gates at each compartment, coupled with an intricate gate lever system, makes this possible. From this particular station the truck loader can empty two compartments.

Simplicity screens play important part in remarkable new "sink-float" plant producing improved gravel

Progressive sand and gravel plants throughout the country are turning to the "sink-float" or heavy media separation method to produce an improved quality grade of gravel. This method insures the positive elimination of troublesome non-durable materials. The installation shown below was made by the Western Machinery Co. of San Francisco, Calif., at the Harry Pickett plant, Northville, Michigan. An important unit in this installation is a Simplicity 6' x 20' Horizontal Screen, one of the biggest of its type in operation today. This installation features a divided screen with ¾ of the deck carrying clean, concentrated gravel while the tailings move over the other ¼. Screen action and a secondary spray system assures positive media recovery over the 20' travel. Get complete information on Simplicity screens and other equipment by contacting your nearest Simplicity sales representative or write us in Durand, Michigan.



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25% MORE WORK AT HALF THE FUEL COST

California contractors McGuire & Hester report they're getting 25% more work—and spending 50% less for fuel—since they converted this ¾-yard dragline from *gasoline to General Motors Diesel power*. The compact "4-71" GM Diesel did such a good job that the contractor repowered two more shovels with GM Diesel.

GM
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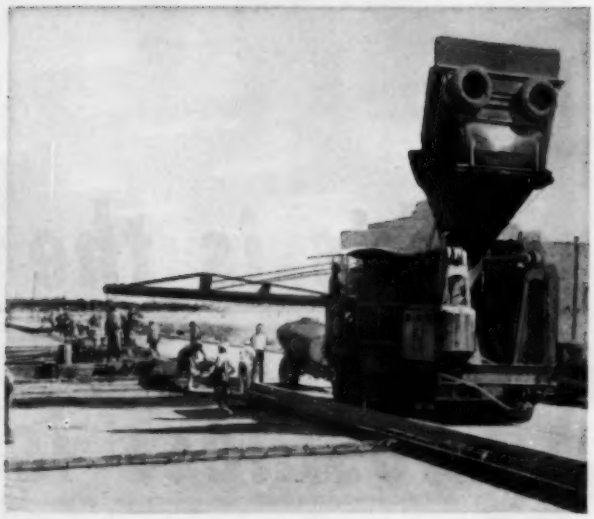
WORKS ⅓ FASTER—CUT FUEL COSTS 60%

Maryland contractor Charles F. Knox, Jr., reports he gets ⅓ more production, has cut fuel costs 60%, since he converted this ¼-yard shovel from *gasoline to GM Diesel power*. The shovel works 8 to 10 hours a day, costs far less to maintain. You can specify GM Diesel power in over 50 shovel models built by more than 20 manufacturers.



PAVES 1400 FEET A DAY

This Koehring Paver, powered by a compact, quick-accelerating GM 2-cycle Diesel, lays 1400 feet of 25-foot wide pavement per day for the Austin Road Company of Dallas, Texas. You can lay pavement faster and at less cost with GM Diesel power—available as original equipment in 8 paver models made by 4 different manufacturers.

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McGuire & Hester *specified* GM Diesel power in two new Buckeye Ditchers and a Lorain Crane, as well as repowering a Hough Payloader, after getting *more work at less cost* with GM Diesel power in their dragline. The master mechanic calls this GM Diesel-powered Buckeye Ditcher "fastest in the area."

NO REPAIRS IN TWO YEARS

These GM Diesel-powered LeTourneau-Westinghouse Tournapulls worked over two years in flying abrasive dust without losing a day for repairs, reports Arizona contractor Link L. Colvin. In every kind of earth-moving equipment GM Diesel power lasts longer, works faster, costs less to run and maintain.

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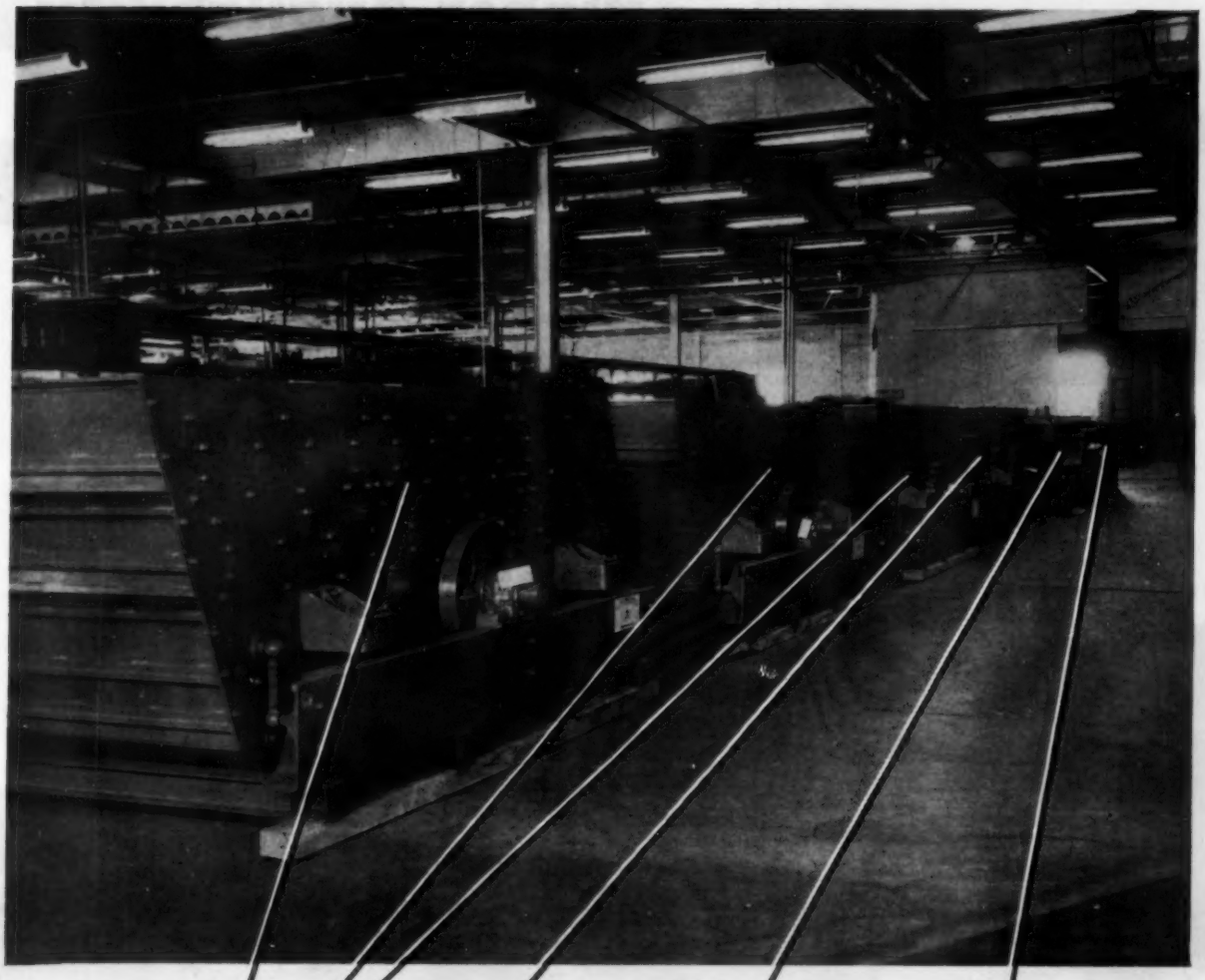

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22-ton "Eucs" with quarry bodies haul stone for Ideal Cement Co. of Colorado. Top speed of this Model 36 TD, with full payload, is 32.5 m.p.h. Spring mounted drive axle and Allison Torqmatic Drive are important factors in stepping up production and profits at this operation.

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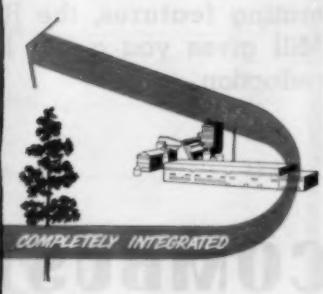

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Achieve maximum productivity of your equipment by grinding your products on a Raymond Roller Mill equipped with *pneumatic feed control.*

This self-regulating device maintains the peak "load" on the mill at all times. Regardless of conditions of feed or grindability, the mill takes all it can handle, and delivers its full capacity, hour after hour.

It is the *steady grind* of the Raymond Roller Mill that piles up production. No irregularity, no down-time, no forgetfulness of the operator, can affect the top-level efficiency of this machine.

In its modern design and engineering, its sturdy construction and fine bearings, its lubrication system and advanced operating features, the Raymond Roller Mill gives you a big leverage in cost reduction.

with

PNEUMATIC FEED CONTROL

operates by air pressure in the mill system and is sensitive to changes in the "load", insuring continuous high capacity

Write for Catalog #72

COMBUSTION ENGINEERING, INC.

1311 NORTH BRANCH ST.
CHICAGO 22, ILLINOIS

Raymond Division

SALES OFFICES IN PRINCIPAL CITIES

January 1955

Review and Forecast

The PIT AND QUARRY field's biggest customer — the construction industry — reached new heights and sustained the nation's entire economy in 1954. It will be even busier in 1955 (and for many years to come) meeting the needs of a growing, dynamic people who demand the best of everything . . . *and get it!*

The demand for the many materials we furnish in such tremendous tonnage to construction and to other industries that serve construction will strain the PIT AND QUARRY industry's facilities.

Our staff reports:

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—JOHN PETER FLYNN

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The Other Nonmetals Climb Right Along, Too 123
—KENNETH A. GUTSCHICK

Special Reports on the Concrete Industries — by Roy L. Peck — feature our CONCRETE MANUFACTURER Section for January 1955

Born 50 years ago, the highway-building tractor has remade the face of America
Caterpillar Tractor Co. photo.

Construction

The PIT AND QUARRY field's *BIG* customer, busier than ever in 1954, bolstered the nation's economy . . . and looks to bigger things in 1955

By JOHN PETER FLYNN

CONSTRUCTION records were broken for the 9th straight year in 1954 with the performance of an estimated $52-billion of work, and prospects are favorable for a continuing increase in 1955 with activity reaching a possible $56-billion.

Continuing its postwar role as the nation's largest single production activity, construction last year consisted of $37-billion in new facilities, and approximately $15-billion in maintenance and repair of existing facilities, representing almost 15% of the gross national product and accounting for more than 17% of the country's gainfully employed.

The 1955 potential of $56-billion within the United States, consisting of up to $40-billion in new construction and approximately $16-billion in maintenance and repair, is predicted on indications of a moderate upswing in total economic activity and availability of capital funds at favorable rates, and assumptions of relatively stable construction costs and no major work stoppages or international complications. The Eisenhower road program is not included.

Since construction is the biggest single consumer of the raw materials produced by the pit and quarry industry and its allied fields, 1955 will be another banner year for the producers of cement, sand & gravel, crushed stone, lime, gypsum, asbestos, lightweight aggregates, concrete masonry and pipe, ready-mixed concrete, bituminized road materials and all the other pit and quarry commodities consumed in such tremendous tonnage by construction. In addition to construction's ever-growing peak demand, the pit and quarry field must also furnish the nonmetallic mineral commodities vital to the production of iron and steel, chemicals, glass, paint, petroleum, and other materials which also face increased demand because of the growing needs of construction.

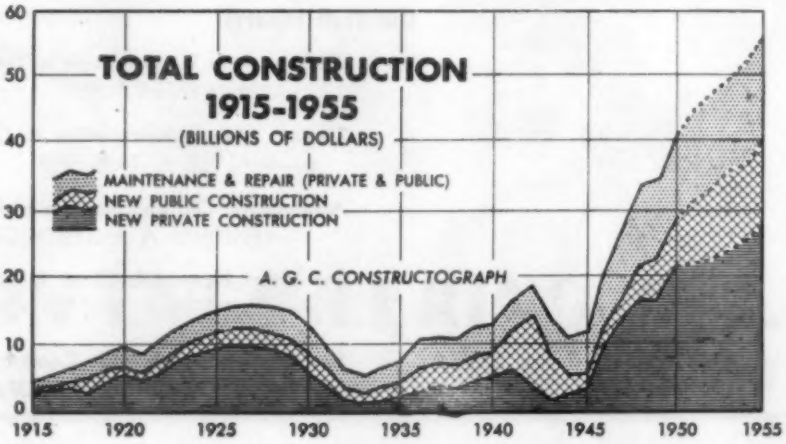
Throughout 1954 the construction industry was recognized as a bulwark of the national economy, bolstering employment and demand for basic materials. The importance of construction was highlighted by its unfaltering rise under the pressure of continuing demand, contrasted with the leveling off or mild decline elsewhere in the economy.

Private construction dominated the 1954 volume of new work, totaling $25.5-billion, while new public construction reached $11.5-billion. The 5% increase in the combined volume was due primarily to rises in private residential and commercial, and in highway, school and community facility construction which more than offset other declines.

In the private categories, residential expenditures increased 12% to $13.3-billion, with an estimated 1,200,000 units placed under construction, due partly to eased mortgage opportunities.

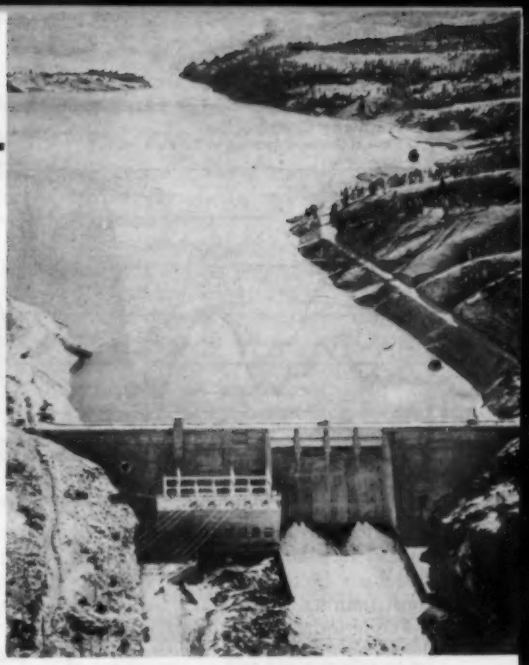
> ● . . . more than one dollar out of every seven spent for end products and service is being spent for construction, and more than 15 per cent of the nation's full-time equivalent employees are receiving their livelihood directly or indirectly through construction . . .
>
> H. E. FOREMAN, Managing Director
> Associated General Contractors

Commercial activity, continuing a boom started with the easing of federal controls in 1953, rose 20% to $2.2-billion, reflecting a surge in office buildings and continuing demand for suburban shopping facilities. Private industrial volume declined slightly to $2-billion as basic expansion goals were rounded out and many facilities being constructed under the government's rapid tax amortization neared completion.

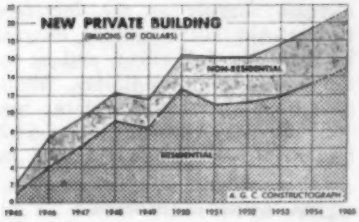


Review and Forecast

• This time last year, virtually all commentators followed the lead of the Federal forecasters predicting a mild drop in construction. The Associated General Contractors alone among the pundits, pointed to the "favorable factors persisting in the economy for a potential continued high rate of activity in 1954". Our own forecast leaned toward AGC's optimism. New construction for 1954 was $37-billion, five percent above the $35.3-billion peak volume of 1953.
A good warning never to sell America short!



Power production and water control are vital ingredients for a growing nation
Bureau of Reclamation photo



New records were set in religious and private educational building, totaling $585-million, and $560-million, respectively, and the $210-million of social and recreational work was a large increase from 1953.

Public utilities, at $4.4-billion, maintained about the same high level of 1953, with increases in construction of electric light and power, pipelines, and telephone and telegraph facilities offsetting declines in railroad, gas and local transit work.

Highlights of public construction were the increasing outlays for highways and other state and local public works, demonstrating a rising dominance over federal projects, and more than offsetting a 29% drop in military construction and a 10% decline in industrial building (principally atomic energy construction).

Public school building passed the $2-billion mark for the first time, and highway construction established another new record at $3.6-billion, rising steeply under the influence of new emphasis on federal-aid programs, as well as toll roads.

Sewerage and water facilities advanced about 15% to $975-million under pressure of the housing boom, which has far outstripped extensions of city water and sewer mains all over the country, as well as the capacity of treatment plants.

The biggest items in the $15-billion estimate of maintenance and repair in 1954 were, in their order of importance, residential buildings, nonresidential buildings public utilities, and highways. Federal agencies recently revised this category up sharply on the basis of new information which disclosed heavier outlays for residential and farm buildings, sewage disposal and water supply facilities, and military and naval installations.

The increasing pressure of civilian needs, as in 1954, is expected to propel construction volume to new heights in the year ahead, with most types of activity sharing in the rise. New private construction will show the largest increase, rising from $25.5-billion to about $27.75-billion, paced by larger outlays for residential, commercial, church, educational, and hospital and institutional building. A mild decline probably will continue in farm construction, and industrial building may come close to the high 1954 level under improving business conditions and provisions of the new tax law.

New public construction is expected to reach about $12.2-billion despite a substantial drop in atomic energy development, with state and local public works accounting for two-thirds of the total. Large increases are probable in outlays for schools, highways, military construction, and sewer and water facilities.

Residential construction is expected to approach $15-billion in private expenditure, with about 1,300,000 new units to be placed under construction. Increased additions and alterations are expected due to the favorable provisions of the 1954 housing legislation and relatively easy mortgage conditions. Public housing may continue its decline.

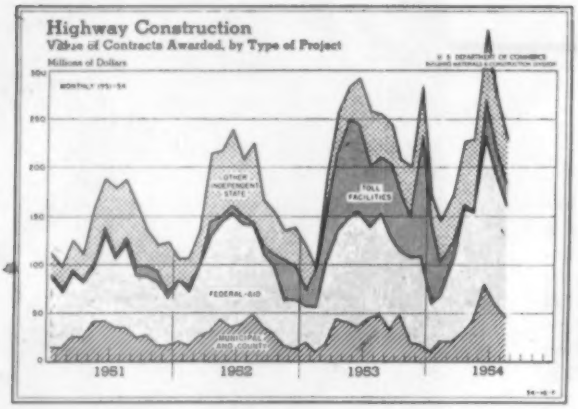
Commercial expansion will continue the brightest spot in business investment in construction this year, since it may rise by nearly one-sixth to about $2.5-billion under the

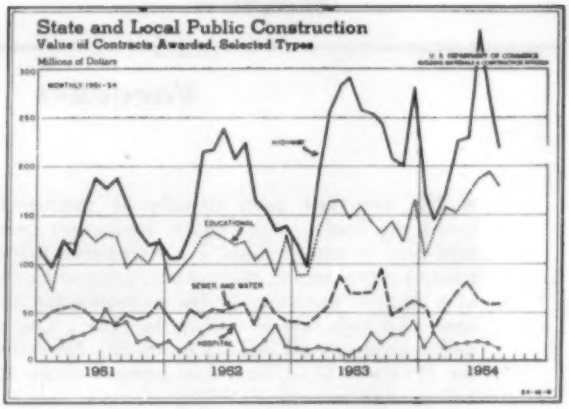
AMERICA'S HIGHWAY PROBLEM

(Why an additional $54-billion is vitally-needed in the next decade)

Mileage of all public streets and highways:			
1941 3,309,000	1953 3,348,000		
Annual vehicle-miles of travel:			
1941 ..... 333.4-billion	1954 ..... 557.0-billion*	1965 ..... 814.0-billion*	
Motor vehicle registrations:			
1941 ..... 34.9-million	1954 ..... 58.1-million*	1965 ..... 81.0-million*	
Total construction needs for all streets and highways through 1964			$101,365,000,000*
Portion to be met by funds expected to be available through 1964			$ 46,800,000,000
Deficit			**$54,565,000,000**

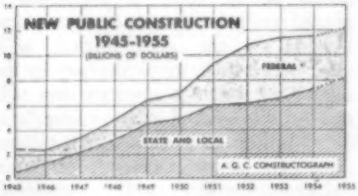
*Bureau of Public Roads preliminary estimates, September, 1954





influence of the continued trend toward new suburban developments and such factors as major highway construction.

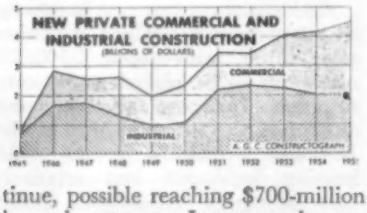
While industrial building has been declining mildly with the completion of expansion goals in major industries and a slowing down of the government's rapid tax amortization program, this category may come close to the $2-billion total of 1954 if business conditions continue on the upgrade. An important factor



that may bolster plant expansion in the future is the provision in the 1954 tax legislation which permits faster recovery of capital investment to encourage modernization and expansion.

Public utilities are expected to continue their current high outlays at the rate of about $4.4-billion, with the electric light and power, pipe line, and telephone and telegraph groups offsetting expected declines in railroad and gas facility construction.

Record-breaking religious and educational building is expected to con-



tinue, possible reaching $700-million in each category. Increases also are anticipated in hospital and institutional building, and social and recreational construction. All relate heavily to the many new suburban area developments and the rehabilitation of older urban areas, which in turn are tied to the high level of individual prosperity and to the continued growth of our population.

Total federal construction is expected to decline slightly, due principally to a one-third drop in industrial building to about $1-billion as major atomic energy expansion tapers off. Military and naval construction, after dropping sharply in 1954, is due to increase nearly one-fifth, to more than $1-billion this year, while a mild decline is anticipated in conservation and development outlays. Some pick-up in the long-delayed federal buildings program is expected under the new lease-purchase legislation.

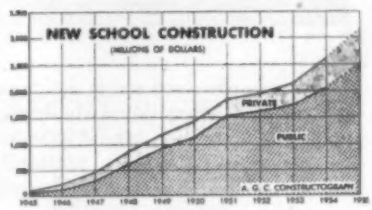
● We cannot be complacent about our natural advantages nor can we rest upon the accomplishments of our fathers. The future of America is a dynamic prospect. It calls for dynamic plans from those who would march forward with it. By 1980 it will be hard to find space in a whaling museum for piers that met the requirements of 1870 and were condemned as obsolete as long ago as 1920. Despite a revolution in the whole technology of transportation and despite competitive hurricanes from the air and over the road, our railroad terminal system still remains virtually as it was in 1921 when Al Smith called it an "old-fashioned way of doing business". The highways and tunnels and bridges we have built are utterly unable to meet the demands of our present, much less our future traffic. The terminal at LaGuardia Airport which was the world's most modern when it was opened 15 years ago is utterly obsolete today, and only last April we tore up plans for new terminal buildings at New York International and began all over again when the airlines urged that the rapid strides of aviation made plans that were conceived in 1952 already obsolete by 1954. . . . We have no cause to be complacent!

AUSTIN J. TOBIN, Executive Director
The Port of New York Authority

Forward thinking of this type has kept the New York area in the forefront in providing modern facilities for its people. More of it should be heard in every city!

The dominant part of public construction — state and local public works — should total more than $8-billion in 1955, mostly highways, schools and other facilities.

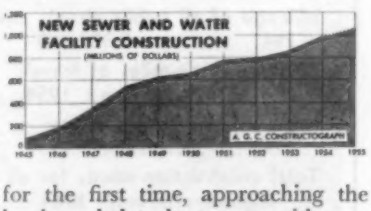
Highway construction is due to increase sharply as the increased Federal-Aid authorizations enacted in 1954 take full effect, and as the toll road boom continues. While government estimates place new 1955 highway construction at $4.2-billion, the tremendous public in-



terest in highway needs now developing may well push the total considerably higher, and result in an even greater rise in 1956 as Eisenhower's Clay Committee proposals jell.

Educational construction should rise by one-fifth to about $2.5-billion, reflecting the severe needs for new classrooms to accommodate public school enrollments which have been increasing by more than a million pupils per year.

Sewerage and water facility outlays should pass the $1-billion mark



for the first time, approaching the level needed to keep pace with currently developing requirements, but leaving untouched a vast accumulation of needs which were built up during and immediately following World War II.

Housing Industry Sees 1955 Its Biggest Year

Six American families in every ten live in their own homes today, yet home-building's biggest boom is still ahead, housing sources insist. More than 9-million families have acquired their own dwellings since the end of the war, give or take a mortgage or two! A near-record 1.2-million became howeowners during the past year. Despite this, indications are that as many as 1.4 million new housing units may be built in the year ahead to set a new record.

Housing entrepreneurs in past history have not been noted for long range thinking, nor for too great concern with the general economic well-being. Too often they were content to "get rich and get out". However, there are healthy indications that the housing industry now has acquired those fundamental viewpoints vital to any responsible, stable industry. Farsighted leaders are imparting to the diverse, widespread elements of the industry the hard-learned realization that long-range planning based on sound economic principles will bring rewards greater than "get rich quick" opportunism that might permit bad economic practices to spawn another Crash.

Federal policies bear directly on the fulfillment of the ambitious housing program forecast for 1955, and builders deem vital the continuation of today's liberal fiscal and credit policies. Full use of the 1954 Housing Act's many provisions is expected to see government and industry combine their efforts to create unusual new concepts in urban development.

In addition to the new housing potential, a large and relatively untapped demand, estimated conservatively at $6-billion a year, exists for rehabilitating and maintaining our present homes.

For the first time in history, the slum problem, acute in many cities, is now eligible for attack under the FHA insurance assistance program and the slum clearance should gain new headway in the months ahead.

Intimately tied to housing is the problem of furnishing adequate modern community facilities for our shifting and growing populations—schools, churches, sewers, hospitals, transportation, etc. Legislation may ease some of these expansion headaches by permitting builders to undertake non-housing structures with government backing. The lease-purchase arrangement, whereby private sources can now build post offices and other buildings for lease to the government, may also be extended to cover other community facilities.

"Americans on the Move" Force Vast Changes In the Face of the Nation — Concrete Benefits

One person in five changes location each year in the United States. This shifting, coupled with a constant population growth, is a basic consideration in the continuing demand for housing, highway and related facilities. Aided by the mobility of motor vehicle, the West and South have undergone tremendous growth in recent years, and vast new suburban areas have opened up around every American city.

The 1940-50 decade saw the Pacific states increase 48.8% in population, while the nation as a whole was growing 14.5%. The Mountain states jumped 22.3%, Texas gained 20.2% and Florida boomed 46.1% as people and business moved towards sunshine and open spaces.

Among the Eastern-Midwestern industrial states, Michigan alone showed more than 20% gain at decade end—much of this the boom-riding automobile workers later to become Charlie Wilson's howling "kennel dogs" when the boom died.

Connecticut, New Jersey, Maryland, Virginia and Delaware all increased above the nationwide average, however, reflecting the heavy city-to-suburb trend and the war-born growth of government activities around Washington. Most other states fell short of the average for the decade, and four actually lost population in the period.

These general trends have carried over into the '50s, with an accelerated growth in the South and West, as industry, freed from the shackles of its traditional power sources and transport systems, has burst forth all over the nation, moving closer to markets and raw materials and to areas offering better plant sites or more attractive labor conditions.

The war took many a city dweller away from his few square blocks and many a farmhand far from his native country. In doing so, it opened up vast new personal vistas, reviving the old frontier tradition of "picking up and moving along" so as to enjoy the variety of life and opportunities America offers.

Fundamental changes have been wrought at the same time in both city and farm life. Fewer hands are needed on today's mechanized farms, work is far less burdensome, and—most important of all—the city's attractions are just a few hours drive away. In the city, better incomes and burgeoning families have sparked the trend to the suburbs, with more Americans owning their own homes today than ever before.

PERCENT POPULATION INCREASE 1940-50	Total	City	Suburbs
New York	10.7	5.4	23.2
Chicago	13.9	6.6	31.2
Philadelphia	14.7	7.3	26.1
Los Angeles	49.8	31.0	69.8
Detroit	26.9	13.9	54.8
Baltimore	23.5	10.5	72.9
Cleveland	15.6	4.2	41.6
St. Lou's	17.4	5.0	33.8
Washington	51.3	21.0	117.1
Boston	8.8	4.0	11.5

The exodus to the suburbs has placed big burdens on government to provide highways, schools, and other community facilities. The central city areas, at the same time, face serious added problems not only because of revenue lost from those moved to the suburbs but from the increasingly-serious downtown decadence. Traffic-choked streets designed for horse and buggy days, repugnant slum areas and other outmoded facilities encourage people to move to the suburbs and, worse, encourage them to stay away from the central city for their shopping and amusement. Some of our proudest cities face rapid decline unless they take drastic action to meet the needs of modern life.

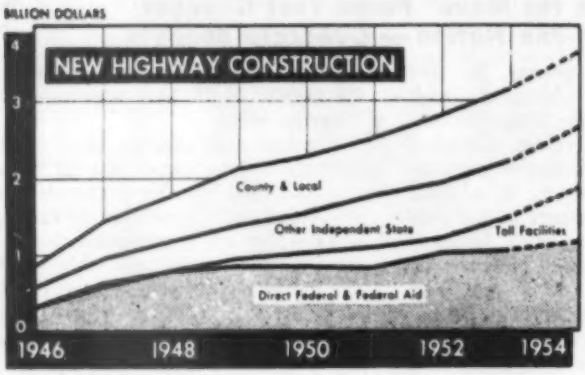
All these trends have had tremendous impact on the construction industry, and thus on the basic pit and quarry field that serves construction in so many ways. The growth of the "new" areas helps to explain in part the rapid rise of concrete as the nation's basic building material.

This versatile material has none of the handicaps of more traditional building materials and offers many desirable characteristics of its own. Less hampered in the "new" areas by antiquated building codes and unfriendly labor attitudes, concrete masonry and ready-mixed concrete have been used in great quantities.

This, of course, has quickened the depletion of easily secured aggregates, forcing pit and quarry to install better-equipped operations and methods while booming the whole new field of lightweight aggregates.

● Let's try to imagine an American continent criss-crossed by broad white highways, some day stretching all the way from the Alaskan arctic to the southernmost tip of South America, capable of moving tomorrow's dream cars safely over distances of 800 or 1,000 or more miles in a comfortable day's driving. It's bound to come. We can't afford to choke our progress and delay the fulfullment of this American dream. The time to start is now.

WALKER A. WILLIAMS, Vice President
The Ford Motor Company



● I submit that planning for the future wanders off into the abstract and unreal when it attempts to insist on mass transportation as an alternative for the private automobile in the development of the great areas that will make up our new Metropolitan Region with its population of over 20-million people. The rising curve of automobile usage and the decline in the use of public transportation . . . is not a struggle between the rails and rubber. It is really a manifestation of the American public's preference for the private automobile as opposed to public transportation. Up to the point of traffic stagnation . . . the American prefers to drive directly from his own home to his destination and back again. And what is more, he can afford to do so — as is evident by the fact that he owns 57-million automobiles today . . . He has fashioned a new American freedom, a freedom of personalized transport — to go where he pleases, when he pleases, and as he pleases — and the symbol of that freedom is the automobile.

AUSTIN J. TOBIN, Executive Director, The Port of New York Authority

HIGHWAY BUILDING WILL NEED MUCH EQUIPMENT

The demands that an increased highway program will make on the manufacturers of equipment and machinery create a two-pronged problem for pit and quarry. We will need additional units of the highly-specialized equipment peculiar to the field to meet added production demands, and at the same time we will have to compete with the construction industry for our share of the vast variety of bulk-materials handling machinery that the two fields use in common.

Producing, as we do, a volume of loose bulk materials that dwarfs all other materials handling industries, pit and quarry already has at work a substantial portion of the nation's so-called *construction* equipment — shovels, cranes, tractors, trucks, wagons, loaders, compressors, etc.

In addition, we consume (a literal definition in view of the tremendous wear and tear characteristic of the field) in huge quantities such supplies as conveyor belting, tires, lubricants, welding supplies, etc., and every year buy a variety of specialized equipment — crushers, kilns, screens, etc., as well.

Reporting to the Clay Committee on the capacity of the construction industry, the American Road Builders Association gives the following picture of what construction will need, equipment-wise, to carry a $101-billion, 10 year road program.

"Based on extensive inventories of contractors' on-site equipment, replacement factors, and trends in equipment developments, the current $4-billion highway improvement program requires some 250,000 units of construction machinery and allied equipment.

"The annual construction machinery and allied equipment requirements for the current highway program are comparatively modest since the annual purchases are mostly replacements with only a gradual fleet expansion taking place. Present construction machinery replacements are estimated at 23,000 units for the current highway construction.

"If the level of the annual highway construction program be expanded to $6.0-billion in the first year, some 72,000 additional units of construction machinery would be needed. The tabulation (column 3) shows the type and amount of equipment that would be needed.

"During the fourth expansion year when a maximum highway construction program level of $11-billion is reached, expansion requirements will be reduced by 50%. By the fifth year the fleet expansion will be over and the annual equipment requirements will be largely of a replacement nature and will amount of little more than current requirements.

"Some relief from the impact of a 50% fleet expansion in the first year could be achieved if equipment now owned but not fully utilized by the highway contractors and equipment now engaged in allied construction activities could be used in the expanded highway program.

"A comparison of the total equipment requirements during the first three expansion years with the maximum production capacity and the current percentage of highway usage, discloses the categories in which shortages are likely to occur if production is not expanded. At the time it appears that shortages might prevail in the following categories during the first 3 years of the expansion:

Off-highway Hauling Equipment
Wheel Tractors (heavy)
Crushing and Screening Plants
Batching Plants
Asphalt Plants
Bituminous Pavers
Concrete Pavers
Concrete Spreaders and Finishers

"The current rate of Construction Machinery and Allied Equipment Industry varies from 33% to 67% of peak capacity depending on the products."

● A transportation system does not stand still. If it doesn't expand and improve to keep pace with the ever-increasing demands of business, industry and commerce, it is falling behind. On this basis, our nation's highways have been going backwards for years. We're trying to get by with roads that were built to handle just about one-third of the traffic that we have today. We need more good roads beginning now.

AMERICAN TRUCKING ASSN.
Public Advertisement

This Is What Road Building Consumes
(all figures in thousands—add '000)

MATERIAL	1954 Program ($4-billion)	$11-billion Annual Program*
Cement (bbls.)	49,440	161,440
Aggregates (cu. yd)	274,800	686,428
Bituminous Materials (gals.)	1,214,080	2,823,258
Lumber (mbm.)	333	939
Timber Piling (l.f.)	10,880	30,645
Structural Steel (tons)	816	2,765
Reinforcing Steel (tons)	680	2,162
Corrugated Metal Pipe (tons)	136	273
Concrete Culvert Pipe (l.f.)	17,680	44,856
Clay Pipe & Tile (l.f.)	6,880	21,155
Petroleum Products (gal.)	570,160	1,438,063
Explosives (lbs.)	79,120	207,591
Steel Fabrication Capacity (tons)	704	2,379
Paint (gals.)	625	1,925
Signs (each)	330	900

*The amount of work that would be done in each of the seven final years of the 10-year $101-billion highway construction program envisioned by the President. Taken from ARBA's preliminary report to General Clay.

CONSTRUCTION INDUSTRY'S ADDITIONAL ANNUAL EQUIPMENT REQUIREMENTS DURING FIRST THREE EXPANSION YEARS
Construction Machinery and Allied Equipment
(Not including Motor Vehicles)

Tractors, Crawler	6,000
Tractors, 2 and 4-Wheel, Off-H'way	4,000
Hauling Scrapers, Crawler	1,800
Hauling Scrapers, Wheel	3,000
Trailers and Wagons, Off-H'way	2,180
Trucks, Off-H'way	950
Power Cranes and Shovels	5,850
Motor Graders	3,000
Rollers, All Types	3,850
Loaders, Front End, Wheel Type	2,000
Ditchers, and Trenchers	500
Hydraulic Hoists and Dump Bodies	4,000
Contractors Pumps	4,680
Air Compressors, Portable	4,536
Batching Plants, Concrete	200
Concrete Mixers, Portable	3,000
Concrete Spreaders	200
Concrete Finishers	200
Concrete Pavers	400
Truck Mixers and Agitators	2,000
Asphalt Plants	500
Bituminous Pavers	750
Bituminous Distributors	500
Crushing and Screening Plants	450
Miscellaneous Units	17,537
TOTAL UNITS NEEDED	72,083

President Eisenhower's "Grand Plan"

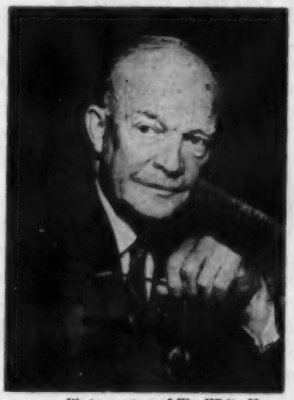


Photo courtesy of The White House

MORE than any other force in American history, save our devotion to the untrammeled initiative of free men working together under our democratic ways, the highway and the motor vehicle have been responsible for the tremendous growth of our nation, which in little more than half a century—a mere eye flicker in mankind's story—has seen us develop a civilization greater and more comfortable than any that has preceded us. The combination of powered wheel and open road tied together the vast areas of this continental empire, welding us into one integrated people, and provided us with the means to exploit for the good of all mankind the abundant wealth made available to us by a beneficent Deity.

America was already straining at the leash, when World War II broke out, so far as highways were concerned. Diversion of the highway user's tax payments to non-highway purposes—an evil too popular in many states—had stunted the normal healthy growth of the road system. At the same time, a restless and resourceful people were striking out for new opportunity everywhere in the land, traveling far from native hearths, while an ever-growing volume of truck transportation was transforming the economic life of farms and factories all over America.

The virtual stoppage of highway work during the war, the rise of vast new industrial regions far from the traditional centers, the boom in our cities and the mushrooming of suburbs all have accelerated the decay of our highway systems. A growing population and a bigger individual "take home" pay combine with longer leisure time to send more people traveling for local pleasure and long-distance vacations. The slogan of the '20s—*a car in every family*—has given way to the reality of two (and sometimes more) vehicles to a household today.

Unlike most nations, America traditionally has looked upon its highways as facilities for peaceful needs—created for the farmer and business man, the traveler and tourist—with public convenience far more important than military purposes. Road building is the province of the state and local authorities, with the federal government acting only in an advisory capacity, establishing standards and coordinating work on the highway systems which it helps to finance.

Last July, giving heed to the growing chorus warning that our highway system was rapidly decaying because the ever-increasing demands of our economy made it impossible to do little more than keep abreast of needed maintenance, President Eisenhower issued his challenging message to the assembled state governors, calling for a $101-billion road-building program in the next decade. More than double our present rate of highway spending, this amount is needed to bring our roads and streets up to par by 1965. Otherwise highway obsolescence will soon strangle our nation's growth.

The President is to be warmly commended for facing up to our great problem with such vision and candor, and for dramatizing the need so effectively to the nation. His broad outlook and long-range view has added a remarkable grandeur to a function of government that too often is measured by political expediency. He has based his program in the needs of a dynamic people, where public works merely supplement a growing country's activities, rather than devising it as a panacea of make-work or make-war *after* an economic fumble, too frequently the record of history.

Timely as is the President's highway program in relation to the needs of our growing economy, it most certainly will assume an even more revolutionary impact on our history, coinciding as it does with the utilization of the power-for-good that is in the atom and with the extension of the "ocean highway" into mid-continent, via the St. Lawrence Seaway. An historic milepost has been placed in the story of America.

—JPF

In essence, the "grand plan" which the President has asked the governors to develop will require the investment of $101-billion in our roads and streets in the next decade. This is the amount that Bureau of Public Roads studies indicate will be needed if our highway problem isn't to strangle us by 1965.

Deducting from the $101-billion figure the $47-billion expected to become available in the normal course of events in the next 10 years you get the $54-billion "nut" for which the states and the Clay Committee have to devise means of financing.

Already General Clay's group has recommended that about half of this $54-billion deficit be met directly by the federal government by taking over the complete revamping of the vital Interstate Highway System—the one percent of our highways that web our major cities coast-to-coast and carry some 20% of our traffic.

Raising the remaining money is the problem of the state and local governments, to be tackled in the 44 state legislatures convening this month. The Clay Committee is expected to suggest various methods of financing the burden. Federal-Aid grants to the states for the upkeep of 630,000 miles of other highways will undoubtedly continue. Toll roads are expected to provide 10% of the full $101 billion outlay.

Besides rebuilding the entire Interstate System, the "grand plan" will raise thousand of highway miles to expressway standards, with hundreds of bridges and grand separations, and will widen and improve a vast mileage of city arteries.

It is estimated that a sum greater than entire federal outlay will be returned to the public as a result of the "grand plan" in savings — the amount now lost in wasted gasoline, excessive repairs, needless accidents and lost time. On top of that, the new roads should pay for themselves many times over in the boost they will give to our economy and our standard of living.

● Diversion of state highway use taxes towards non-highway purposes totalled over $294-million in 1953, a new high, the National Highway Users Conference reports. In the 26 diverting states more than 13c of every highway tax dollar is spent for purposes totally unrelated to highways. The federal government diverts some of its highway revenues too!

The Long Look: Public Works Doubled by 1965 — Yet Will Be A Smaller Part of Our Larger Economy

Our national economy will reach the $500-billion level within the next decade, without inflation and with less government in business, President Eisenhower declared recently. Startling to some, this rapid growth in our total output of goods and services (now at $355-billion annually) echoes the last economic report of President Truman, and is derived from the comprehensive studies into every facet of our national economy by the Joint Committee on the Economic Report (Congress).

The national output for 1965, based on current price levels, is figured at $535-billion by Grover C. Ensley, the Joint Committee's staff director. Our labor force is expected to have risen 11-million by then to 73-million, not counting those in the armed forces or unemployed, both of which groups may remain fairly constant or even drop off slightly.

Consumer spending, key to our economic health, will total $360-billion ten years hence, compared to $230-billion in 1953. The tax rate in 1965 is expected to be about 20% below today, but the enlarged economy will yield a bigger "take" for the Internal Revenue man. Public works increases will add $10-billion to the 1965 government outlay, expected to total $95-billion for all levels of government. Private investment in our physical economy will add $80-billion a year to round out the $535-billion annual volume.

The president's attitude makes it obvious that this greatly-increased rate of national productivity will be sought by keeping government a minor partner of private enterprise. However, the tremendous expansion needed in factory and equipment, in roads, power facilities, sewage and water systems, education and hospital facilities, etc., will certainly demand a level of public works spending that will make the $20-billion FDR laid out in the seven years of the New Deal program seem picayune indeed.

Experts say that public works spending in 1965 will be twice the present $20-billion level. No matter how big, however, public works will only be a supplementary factor in the ruggedly-healthy economy.

Financing this great growth in our national productivity, and controlling it so that there will be little danger of serious dislocations to endanger the health of the economy are the major problems facing our people —the President, Congress, the states, industry, finance, and you and me.

Today, the federal, state and local government units spend a combined total of $9.2-billion a year for public works. Over half goes into roads and streets, $2.5-billion is for educational facilities, $1.1-billion for water and sewage systems, and $600-million for hospitals.

The next decade will require an annual outlay of $21.2-billion for public construction, government sources indicate. This means adding $12-billion a year, with highways to be allocated an additional $5-billion, schools $4-billion, water and sewers $2-billion, and hospitals $1-billion.

● The charge has been made by the enemies of our way of life that sustained prosperity is impossible to us without war. . . . Perhaps war IS necessary if our people are to have jobs and our nation to continue to prosper without periodic, tragic descents into depression. . . .

But what KIND of war must we wage? . . . may it not be an intelligent fight to the finish against all the elements and factors that would stem the dynamics of a creative, progressive people? . . . We must fight for peace . . . for peace WITH prosperity.

. . . our weapons? They are the minds of far-seeing men. They lie in the vision of those who believe in freedom as the greatest investment of all time and who see, in today's domestic development, today's and tomorrow's domestic stability.

ARTHUR C. BUTLER, Director
National Highway Users Conference

No Danger of Shortages In Asphaltic Materials

Ample production capacity exists to meet any increased demand for asphaltic materials needed in road and airport building and maintenance in the next few years, the Asphalt Institute told the American Road Builders Association recently. Highway work takes about three-fourths of the present output, which ran 78.9-million barrels in 1953.

Since the volume used for other purposes (roofing is the most important) remains fairly constant, the industry's huge reserve capacity could easily be put to work to meet any highway need, the Institute says.

If it were to operate today, on a 24-hour day basis, the asphalt industry could easily produce 210-million barrels a year, using present refinery installations and the same gravity crudes, the Institute claims. This could be upped to 252-million barrels of July merely by changing to lower gravity crudes; and it would be equally simple to produce 336-million barrels in 1956.

CEMENT SHORTAGE SEEN

CEMENT PRODUCING DISTRICTS	Present Annual Capacity ('000 bbl.)	Needed for $11-billion H'way Program ('000 bbl.)
1. New York and New England	17,700	16,798
2. Pennsylvania, Maryland, Delaware, New Jersey, District of Columbia	38,900	20,121
3. Ohio and West Virginia	26,400	14,190
4. Michigan, Illinois, Indiana, Kentucky, Wisconsin	42,000	45,603
5. Southeast	38,000	20,092
6. North Dakota, South Dakota, Minnesota, Iowa	22,500	9,710
7. Nebraska, Kansas, Missouri, Oklahoma, Arkansas	18,800	15,353
8. Texas and New Mexico	21,900	6,386
9. Idaho, Montana, Wyoming, Nevada, Utah, Colorado, Arizona	10,500	1,781
10. Oregon and Washington	8,300	988
11. California	35,100	10,418
TOTAL	280,100	161,440

Cement Industry Must Enlarge Its Facilities

Even a modest increase in the nation's highway building program will cause acute shortages in the cement supply, especially since the volume of other types of construction is expected to rise in 1955 and to continue rising. Cement has been in tight supply in most areas since the end of the war, even though the industry has increased its capacity by one-sixth since 1945.

Comparing the present peak productive potential of the mills (280.1 million barrels a year) with the quantities of cement that would be needed for an $11-billion a year highway building program (which the President's plan will require), the ARBA comes up with the startling picture above—showing that the highway requirements in many producing regions would eat up nearly all the output, leaving little or no cement for other construction.

The record-breaking 1954 highway program consumed only about 50-million barrels of the total production. The balance went into the concrete manufacturing industry (to make block, pipe, ready-mix, etc.), into general building and maintenance, dams and waterworks, and other uses, including a small amount of special purpose cements vital to the oil-well drilling industry.

Output during the past year ran well above the 90% of capacity that is considered maximum (since allowances must be made for kiln shutdown and the like). The 1954 production topped 265-million barrels comfortably, despite strikes in the major producing regions of the East. Consumption was at an even higher rate, eating into clinker reserves built up for early 1954.

Review

Cement and Forecast

1954 Eighth Consecutive Peak Year

Production, shipments, value reach new record levels; higher output seen for 1955

By WALTER E. TRAUFFER

ALTHOUGH official figures are now available for only the first ten months of 1954, these and direct information from most of the nation's producing capacity make it certain that the portland cement industry again set new all-time records in production, shipments and value by a substantial margin. The official 10-month figures, with conservative estimates for the last two months of the year show that 1954 production was about 268,000,000 bbl., shipments about 269,000,000 bbl., and value was about $730,000,000.

This was an increase of about 2 percent in production, 3 percent in shipments, and 4 percent in value over the 1953 record totals of 264,022,000 bbl., 260,880,000 bbl. and $698,000,000, respectively. This remarkable showing was due to the continuing effort of the industry in general to meet the ever-increasing demand by getting maximum output from existing facilities and by continuing its extensive expansion program. Evidence that the industry has done a good job in this respect lies in the fact that there were, as in 1953, no serious or prolonged cement shortages over any large area and only a few short and localized shortages.

Shipments of portland cement during the first ten months of 1954 exceeded production by 9,697,000 bbl., bringing the stocks on hand at the end of October to 9,655,000 bbl., the lowest point of the year. This was the lowest level since the end of October 1952 and was only 4,000,000 bbl. over the record low of 5,668,000 bbl. at the end of October, 1948.

During 1954 the cement industry again operated at a very high percentage of its rated capacity. Government figures show that capacity at the end of 1953 was 287,498,330 bbl. and that production was 264,022,000 bbl. or about 92 percent of capacity. Our own estimates indicate an increase of 5,000,000 bbl. in 1954 for a total capacity at the end of 1954 of about 293,000,000 bbl. annually. With an estimated production of 268,000,000 bbl. in 1954 this would indicate that production was about 91 percent of capacity. This excellent record was made in spite of a rather serious strike early in the year which involved a number of plants in the East.

Other than these strikes there seem to have been no serious handicaps to production in 1954. There were apparently none of the freight car

The plant of the Lehigh Portland Cement Co. at Union Bridge, Md., which is to be expanded at a cost of $15,000,000 to a capacity of over 3,000,000 bbl. annually.

shortages which were so serious a few years ago and no shortages of fuel, labor or materials and equipment. Apparently no serious handicaps of this nature are expected in 1955.

The fact that in both 1954 and 1953 there were no serious or prolonged shortages of cement indicates that the capacity of the industry in the last two years has kept pace with the increasing demand. The only shortages of consequence were in areas supplying the Ohio and New York toll superhighways.

After the cessation of hostilities in Korea there was a period of uncertainty as to whether or not prosperity was largely dependent on war or defense expenditures. As a result business in general dropped slightly during 1954 but construction continued its upward swing. With highway construction at a record level and even larger programs being planned there is widespread confidence in the future in the cement industry and industry in general.

As usual, it is impossible at this time of the year to make any accurate forecast of the demand for cement in the year ahead. The answers to a questionnaire sent to every producing company indicate that nearly everyone expects to produce and sell more cement than in 1954 and they are practically unanimous in predicting record production and shipments for the industry in 1955 and for some time thereafter. The only uncertainty seems to be on how much increase in demand there will be. The most pessimistic reports were from California and the Pacific Northwest, where several producers felt that 1955 demand will be about equal to 1954. The most optimistic predictions were that demand would be up 10 percent in 1955 and that the 300,000,000-bbl. mark in shipments would be reached within five years. Judging from these reports the limiting factor in cement shipments for 1955 will be the industry's ability to produce. Using the 91 percent factor and the estimated mid-year capacity of 299,000,000 bbl. this would mean shipments of about 272,000,000 bbl. in 1955.

CURRENT CONDITIONS

Judging from the many letters received from cement producers in all parts of the country, the industry in general had to operate at near capacity in 1954 to meet the demand, in spite of the many expansion programs and new plants completed in that and preceding years. There were shortages of cement in only a few areas due to special local conditions, and then only for short periods. Only in California did anyone report sales lower than in 1953.

Calaveras Cement Company is using what is said to be the world's largest industrial drill, a rotary, in its San Andreas, Calif., quarry. It is the only one of its kind currently in use in the cement industry.

All reported excellent prospects for 1955, with demand expected to crowd production, even allowing for the continuing increase in capacity from expansion or new plant programs under way or to be started soon.

The head of a company operating plants in the eastern part of the country says: "It is my judgment that the prospects for the cement industry are good in the near future and on a long-range basis. Aside from the demand for cement created by the backlog of highway, school, and hospital construction, the normal increase in our population should for the next several years maintain a relatively high level of cement consumption. Our volume of business was only slightly greater in 1954 than in 1953, although in both years we were able to market the entire output of our plants. I anticipate that the demand for our product in 1955 will exceed that of 1954.

"During the past year the demand for cement in the Northeast was accentuated by extended work stoppages in several major producing plants, and as a result rather substantial quantities of cement produced in outlying areas were shipped into metropolitan New York and adjacent territories. In the Southeast, the demand seemed to exceed the supply only during a relatively short period of peak consumption."

The head of another company with several plants in the East says: "The outstanding factor in the cement industry today, it seems to me, is the demand for our product, and I foresee no slackening for some time to come in the area our company serves. One of the most important trends in the industry is the rapidly mounting growth of the ready-mix business, and the resulting replacement of bagged cement by shipments in bulk.

"Another trend, in the producing end of the business, is the mounting employment of automatic equipment in the various manufacturing processes . . .

"Personally, I believe the demand for cement can be expected to continue unabated, and among my reasons for this belief are:

"1. The road building programs being projected in all sections of the country by the states and by the Federal Government.

"2. The trend towards decentralization of industry . . .

"3. The increasing awareness of people generally that concrete is an attractive, economical, and permanent building material . . .

"4. A rapidly increasing population, an expected increase in our national income, and the increasing demand for the products of industry."

An official of a company operating one plant in the East says: "1954 has been a momentous year in our industry, as you well know, and of course the upward trend in production and shipments, which goes back to the end of World War II, continues; and once more the cement industry will establish records in all departments. As for the future, we feel that the outlook, barring some national trouble or catastrophe, is very bright; and it is our opinion that the industry will pass the 300,000,000-bbl. mark within the next five years. The growth of the country, the projected population increase, the gain in the standard of living (cement and construction are very definitely a part of that), and the increased share of the construction dollar which comes to cement—all these factors lead us to believe that our industry faces a 5- to 10-year period of expansion."

A spokesman for one large company operating plants throughout the greater part of the country says: "Notwithstanding strikes at many of the industry's plants during the late spring of this year, resulting in a loss in production of 2,500,000 to 3,000,000 bbl., cement shipments during 1954 increased substantially over those for 1953. Our own production was halted by a strike of

seven weeks' duration at ———— which seriously interrupted production at that plant. Regardless of this, however, our own shipments in 1954 showed a marked increase over those for 1953, and this increase was well distributed throughout the various markets we serve."

An official of another large company producing nationally states: "Shipments of the industry in 1954 are likely to reach 270,000,000 bbl., another new record. In each of the last 10 years more cement was shipped than in the previous year. It is reasonable to assume that this trend will continue in the foreseeable future in the light of our continuously increasing population, which brings with it the need for all kinds of new construction.

"In our opinion, the development most significant to our industry in 1954 is President Eisenhower's 10-year highway program. This program, in addition to current expenditures for highways, could result in a total highway investment over the next 10 years of as much as $75,000,000,000. It has been estimated that 54,000,000 bbl. of cement were used in highway construction in 1954. If the President's program materializes as expected, it is reasonable to expect a highway demand of more than 70,000,000 bbl. in a not too distant year."

A producer in the eastern Middlewest says:

"Our volume of business in 1954 was slightly greater than in 1953, although both years required our full production. We were able to increase, through efficiency of operation, approximately 5 percent."

Another in this area says: "I agree with the industry in general that the cement business will be good for years to come. This thought is expressed without taking into consideration the President's pending multibillion-dollar road program. I will become excited about this program when they have actual figures available including the definite means of providing the money.

"When I state that the cement business will be good, I feel that there will be soft spots in the picture which will change from time to time. One of these spots in 1954 was in our own shipping territory. While there was plenty of construction work, yet there was no great volume business to speak of such as highway projects, etc. The ready-mix business has been off somewhat in Pittsburgh for several years. The bulk of our territory shipments have gone to the surrounding smaller localities. All of the local plants were full by May due to the slow winter, and if it had not been for the shortages in the East, I doubt if any of us would have shipped our full production. However, with this outlet we will wind up 1954 with an all-time record on shipments."

According to an Ohio cement company executive: "The volume of cement business generally in Ohio in 1954 exceeded that of 1953, and the outlook for 1955 indicates an increase over 1954, due to heavy paving commitments on the Ohio Turnpike and an accelerated state highway program. Due to improved plant efficiency, we were able to slightly increase our shipments during 1954 over the shipments made during 1953."

The president of a Michigan company states: "I think that business should be good for a number of years. The indications are that construction will be up in 1955 over 1954, and it looks, especially in this territory, as if there will be considerably more highway work.

"Production is increasing in our territory, and we look for quite a little more to be available next year than there was this year; this will be brought about principally by new installations which were completed early this year, but from which various plants did not get the full benefit the full year. Even with increased production in Michigan, the indications are that cement may be short of the demand next summer in this state, a situation that will be brought about principally by the tremendous amount of cement that has to go on the Indiana Turnpike a few miles south of our state line. This will take cement that otherwise would stay in Michigan."

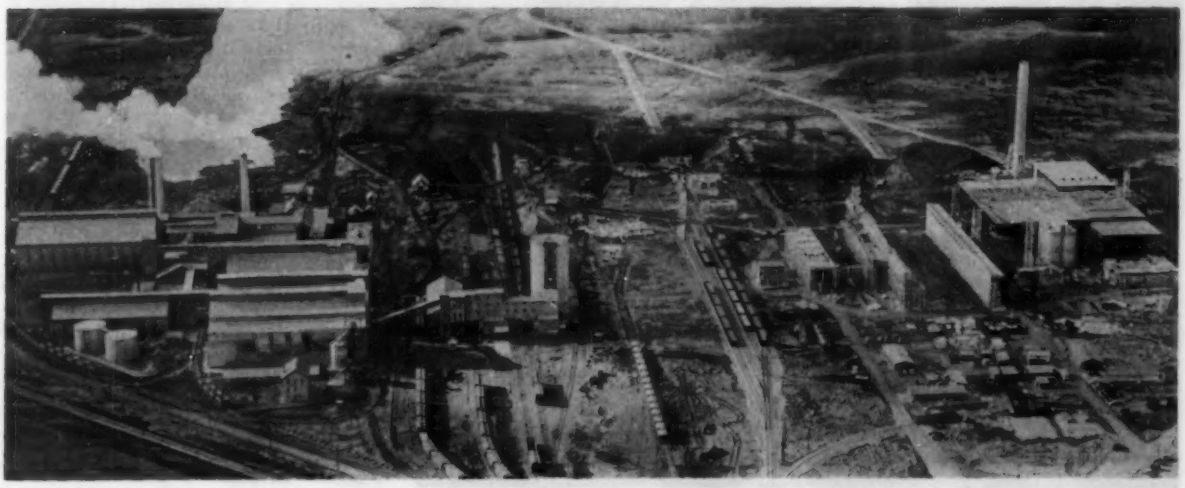
A producer in the southern Middlewest says: "In the area with which we are familiar, the present condition is that there is a demand for all the cement that can be produced. In view of indicated road building, it is likely that this condition will last for several years, possibly with occasional lulls in the demand due chiefly to weather.

"In view of the prospects, there is a strong trend toward increasing production by practically all cement companies."

A Missouri Valley producer reports: "The demand for cement in the territory served by our company was a little greater this year than last, and for 1955 the prospects are for a still heavier demand. There have not been any unusual changes or trends in market distribution in our section of the country."

One Texas producer says: "We expect the strong demand for ce-

The old plant of the Canada Cement Co. at Winnipeg, Manitoba, with new plant under construction (at right) which will double the present 1,600,000-bbl. annual capacity.



ment which developed during the last half of 1954 to continue well into the year 1955."

The head of a company operating several plants in the West says: "At the moment my impression is that the cement industry will be kept busy during the next few years. I am still mindful of the likelihood that there could and well may be a downturn in the economy which would create a temporary slackening in the demand for cement; but I firmly feel that for the long-range view, short of anything less than total war, there will be a continued demand for better streets and highways, including super-highways, the development of which will as a collateral effect bring into being a great deal of additional construction . . . "

"Your question with regard to the most important developments and trends during 1954 can be answered as follows: In my opinion the crystallization of the highway program and the bringing into focus of the need for development of our internal resources, as contrasted with the philosophy of the last 25 years of spending all of our money abroad, I believe is the most significant thing with regard to the cement industry. A small part of the money that we have been putting out for foreign development, if invested in natural resources at home, will stimulate construction and consequently the use of cement to a degree heretofore perhaps unknown in this country."

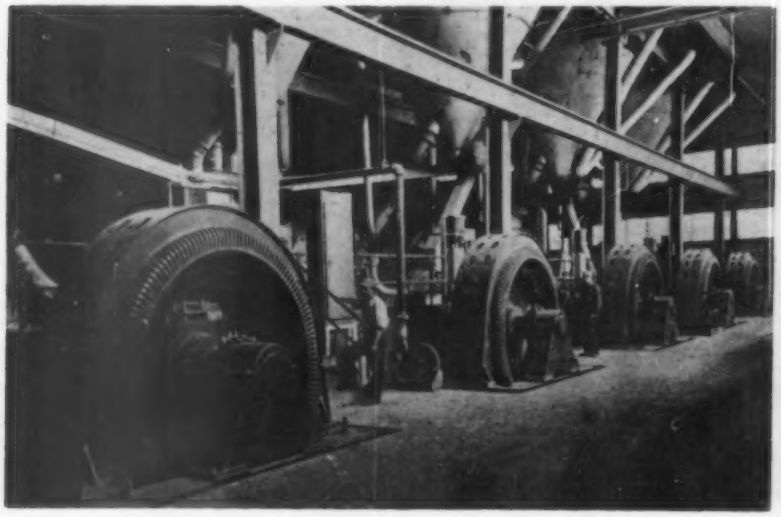
In southern California, according to one producer: "The slight excess of cement demand over supply existing during early 1954 has disappeared. For the foreseeable future, we believe the normal situation of excess production capacity will exist. This forecast is based on capacity increases now under way or planned by each of the producers in this area. In addition, it is our belief that the housing boom will level off during 1955. There is evidence to indicate that this phase of construction has been accelerated in this particular area at a greater absolute and relative rate than in any major market in the country. Stabilizing influences, however, include a continued high rate of military construction projects and flood control work here, as well as the federal highway program . . . "

Another producer in northern California states: "Although according to the U. S. Bureau of Mines, 9-month cement shipments in northern California are off only 7 percent from last year's peak, 1954 saw the return of the buyers' market. There has been no shortage of cement in northern California. . .

"Federal Reserve figures show that, contrary to the national trend, heavy construction in this region is substantially less this year than in 1953. Intensive competition between contractors for large jobs emphasizes this drop in volume of reclamation and military construction. California's record $205,000,000 highway program—largest of any in the nation—has helped to offset the decreased demand in some of the other uses for cement."

One producer in the Pacific Northwest says: "At this time it looks to us as though 1955 shipments in this area would be no greater than 1954 and possibly lower. This is caused by the completion of major dam projects and a decline in the National Defense projects in Washington and in Alaska."

The five new raw- and finish-grinding mills in the Dragon Cement Company's plant at Northampton, Pa., are almost completely automatic.



PROFITS, VALUE AND COSTS

The very incomplete information now available indicates that the cement industry in general made a better profit showing in 1954 than it did in 1953. The volume of shipments was up substantially and so were prices and value, but it is too early to come to any definite conclusions on profits. The information available on a few companies for the first 3 or 6 months of 1954 indicates that the increase in profits in the industry may be substantial. One guide is the growing popularity of cement stocks with the investing public during the year.

More complete information is available on 1953. The dollar volume of sales that year, judging from fairly complete reports, was up 9.3 percent and the net profit for the industry was up about 12.7 percent over 1952. Actually net profits in 1953 were about 12 percent of sales value, the same as in 1952 and 1951.

Preliminary government figures show that the value of the 260,880,000 bbl. of cement shipped from mills in 1953 was about $698,000,000 or about $2.67 per bbl. at the plant. This was an increase of $0.13 per bbl. over 1952, when the average value was $2.54 per bbl., the same as in 1951. In 1952 shipments of 251,368,503 bbl. were valued at $638,512,228 at the mill.

There are also no official figures available on the value of the cement produced for any part of 1954. The fact that shipments were up about 3 percent and that numerous price increases were put into effect in all parts of the country during the year, however, make it certain that a new high record in value was set for the ninth consecutive year. Total value appears to have increased at least 4 percent for a new record of over $730,000,000.

Prices will apparently continue to rise in 1955 to meet the increasing cost of doing business. Major cement producers in the northeastern section of the country recently announced a price rise of 15 cents per bbl. for that area, effective January 1, 1955. This increase will bring the area's prices to the same level as that prevailing in the rest of the country, completing a round of similar rises that began last summer in the South and Middlewest. This increase covers seven states from Cleveland to New England and is applicable to nearly 50 million bbl. of capacity.

On the subject of cement prices and their relation to cost of production one large company operating numerous plants east of the Rockies said: "In some of our territories it

was necessary for us to increase prices during the present year to compensate for higher costs for labor and many of the other essential services, machinery installations, repair parts and supplies now prevailing."

Another large company operating numerous plants throughout the country said: "The current high cost of building new cement plants should be supported by higher selling prices. Many existing plants were built at a cost of $3.00 or less per barrel of annual capacity. Three times that amount is now required in the construction of new cement plants."

Several midwestern and western producers made similar statements, one of them pointing out that reduction of taxes would serve the same purpose as raising prices.

A producer in the Pacific Northwest said that: "One of the major disturbing elements is the increasing cost of labor. With increased competition from other types of construction materials, it is becoming more difficult to increase cement prices to help compensate for higher wages. The item of fringe benefits is assuming alarming proportions."

A California producer said: "A matter of possible future concern to cement producers here and elsewhere may be cement prices and their adequacy in returning revenues with which to replace plant capacity. The current high cost of cement production capacity of $10 to $12 per barrel —and the relatively very low price increase of cement in contrast with other building materials* are both signs that producers may not be completely realistic in considering (a) the ultimate need to replace capacity at the end of useful equipment life (b) the inevitable need to maintain modern cement plants to achieve competitive strength, and (c) the possibility that relatively low depreciation charges are reflected in artificially low costs and prices and that sales revenues may, therefore, be inadequate to maintain a dynamic modern industry."

CAPACITY INCREASE

Again in 1954 the portland cement industry in the United States increased its capacity considerably, probably more than in 1953, and possibly more than in any other year since World War II. Two new plants went into operation, as compared to none in 1953, three in 1952, three in 1951, four in 1950, one in 1949, two in 1948, and one in 1947—a total of 16 since the end of the war. One of the two new 1954 plants replaced a plant of less capacity, the other was in a location where portland cement had never before been produced.

In addition at least 17 plants completed major expansion programs in 1954 which added considerably to their capacity, and dozens of others made less extensive improvements, many of which also added to capacity. As usual complete information is not yet available but we estimate that the actual amount of capacity installed must have been at least 12,000,000 bbl. annually. Much of this is known to have replaced old capacity removed or shut down but, judging from available information, there must have been at least 5,000,000 bbl., or over 2 percent of actual capacity increase.

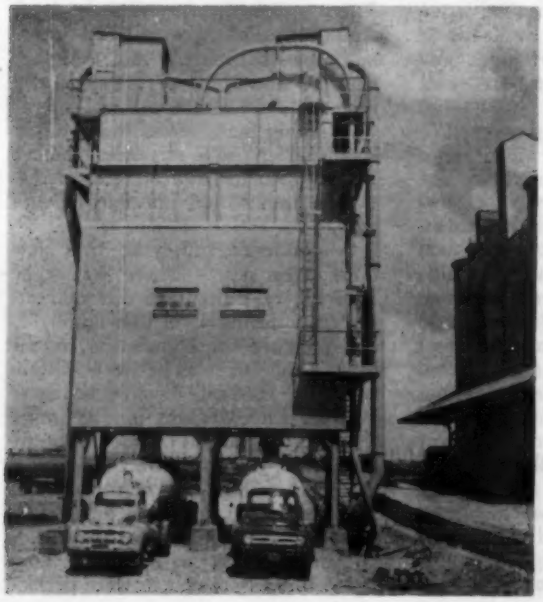
In our review of 1953, published in the January, 1954, issue of PIT AND QUARRY, we estimated that plant additions in that year totalled about 3,000,000 bbl. of new annual capacity. According to a recent Bureau of Mines report the estimated annual capacity of the portland cement industry at the end of 1953 was 287,498,330 bbl. (not including Puerto Rico), compared to 284,014,416 bbl. at the end of 1952. This was an actual increase of 3,484,914 bbl. or 1.2 percent. Using the above figures the capacity of the portland cement industry in the United States is now about 293,000,000 bbl. annually.

According to our information there were 12 new kilns installed in 1954, of which several are known to have replaced old kilns that have been or will be dismantled. Considerable other equipment was also installed, including at least 26 grinding mills, of which some also are known to be replacements. Much of this equipment was installed independently of kilns and actually increased capacity by eliminating bottlenecks.

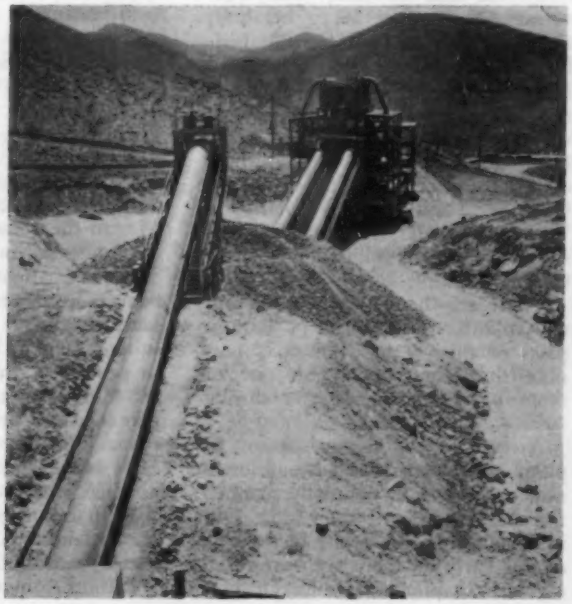
No complete existing plants are known to have been taken out of operation in 1954 but one of the two plants, the 1,200,000-bbl. operation of the Missouri Portland Cement Co.

*Bureau of Labor Statistics figures indicate an increase of about 65 percent in cement wholesale prices since 1939, while all building materials have increased in price over 150 percent.

The modern new bulk-truck-loading installation of the Halliburton Portland Cement Co. at Corpus Christi, Texas.



The Southwestern Portland Cement Co. installed at its Victorville, Calif., plant this new crushing and screening department.



at Sugar Creek (near Independence, Mo.), was built alongside an old 1,000,000-bbl. plant which has been taken out of production and will eventually be dismantled. The other new plant, that of the Southern Cement Co. at Roberta, Ala., is a completely new operation with a capacity of 1,000,000 bbl. annually.

In 1953 the percentage of the capacity of the industry utilized was apparently about 91 percent, compared with official figures of 87.8 percent in 1952 and 87.4 percent in 1951. It has been estimated that at the end of 1954 the capacity of the industry was about 293,000,000 bbl. and as production was about 268,000,000 bbl., about 92 percent of capacity apparently was utilized.

Official figures on the capacity of the cement industry are:

End of 1948	254,272,378	bbl.
" " 1949	258,948,399	"
" " 1950	259,448,000	"
" " 1951	281,873,000	"
" " 1952	284,014,416	"
" " 1953	287,498,330	"
" " 1954 (est.)	293,000,000	"

FUTURE INCREASE

At this time the information available on the amount of work under way, or definitely planned for 1955 starting, is necessarily incomplete, nor do we know just how much of the known work was completed in 1954 and how much will be completed this year. There are known to be four new plants under construction or to be started on soon—those of the California Portland Cement Co. at Mojave, Calif., the Universal Atlas Cement Co. at Buffington, Ind., and the Halliburton Cement Co. at Clarkdale and Phoenix, Ariz. Universal Atlas' plant is to be built alongside existing operations at Buffington and this project includes a new clinker grinding and cement distributing plant at Milwaukee which will receive clinker by boat from Buffington. The Halliburton project consists of a complete new plant at Clarkdale and a new plant at Phoenix which will receive raw slurry by 110-mi. pipeline from the Clarkdale plant.

There are the usual rumors about new plants to be built in various parts of the country and it is possible that construction on one or more of these might start during 1955.

A very considerable amount of plant improvement and expansion is now under way or definitely planned for completion in 1955 or later. Our information is necessarily incomplete at this early date but we know that at least 28 plants have major programs under way or definitely planned. A number of companies report that they have major programs in preparation for announcement at a later date and still others report that they are making studies with the view of making expansions when required by market conditions. The impending vastly expanded highway program is credited by several with providing the necessary impetus to cause them to decide to go ahead with such work. There are, of course, the usual large number of minor improvement programs under way or definitely planned.

These plants, together with the four new plants listed above, will install at least 27 new kilns and a large amount of other equipment. These programs add up to over 30,000,000 bbl. of cement porducing capacity of which we believe at least 12,000,000 bbl. will be new capacity. It is believed that at least half of this new capacity will be in production by the end of 1955 and the balance early in 1956.

Several producers also pointed out means by which additional producing capacity could be obtained if necessary. A California producer said: "We can easily increase our effective capacity by eliminating specialities and by increasing cement and clinker storage and if need arises by adding clinker crushers and other facilities. In addition, effective capacity could be greatly increased if cement could be shipped to federal jobs on mill certificates rather than after the usual 7-day test."

HANDICAPS TO PRODUCTION

With the prospects good for several more years of peak demand most producers answering our letter had little to say about handicaps to the industry. Several thought-provoking letters, however, are well worth quoting.

An operator in the East says: "We feel that high corporate taxes are a decided handicap in providing for the expansion of industry, which applies to the cement business. But on the other hand, we look at the huge government debt and the world difficulties and realize that we must sacrifice a large part of earnings in support of the government's effort to protect us in world affairs.

"Also we share the alarm of other people as to pressures of organized labor and the disregard in many cases of contractual obligations, but at the same time we acknowledge that in our own case we have had for the most part friendly and satisfactory negotiations.

"Another matter that might be a serious handicap is the ordinances attempting to control air pollution. We are all for doing the best job we can in having a clean plant and minimizing the amount of any substances expelled into the air. We are confident that we are doing a good job but there is before local authorities here an air pollution ordinance that, if enforced, would shut down all of the major industries having stacks in this area, and not only here; if applied other places it would do the same. Everyone is, of course, aware of the bad situation in Los Angeles where nature appears to be working against the efforts there. I think it is a matter that everyone should give considerable attention to and I believe that industry is not the major offender and is spending more time and money on it than any other contributing factor. I particularly refer to the great increase in motor vehicle operation and the gases expelled into the air."

Another company in the East says: "The chief handicap in doing business today is the great expense involved in replacement and expansion facilities in the cement industry."

Still another eastern producer says: "The greatest handicap to production during 1954 was, of course, the strike in the northeast, which forced so many mills to shut down for a considerable period last spring."

CEMENT SUPPLY

Judging from these letters and other information, the cement industry in this country as a whole was able to handle the demand in 1954 without great difficulty as increase in productive capacity just about balanced off the increase in demand. There were, however, slight and temporary shortages in some areas and somewhat more serious shortages in Ohio and New York due to the huge demand of the toll superhighways being built across those states. As usual in such instances cement was shipped in from far greater distances than would normally be the case.

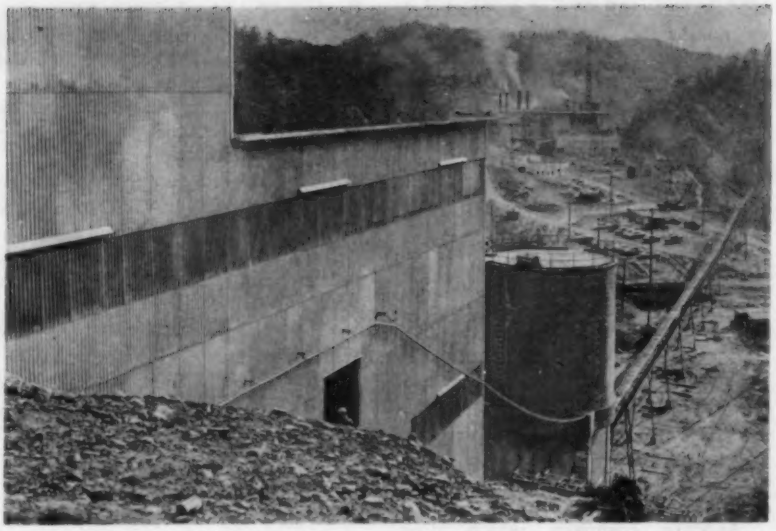
A producer supplying the New York area says: "There was some shortage of cement in our marketing area during 1954 due largely to the pressure for completion of the New York Thruway between Buffalo and the Hudson River, but there was an improvement in 1954 over 1953. So far as we can see now the supply for our area will be sufficient for 1955 needs, except for unforeseen pressures that may develop in public works."

Another supplying both New York and Ohio says: "There were periods

of peak demand during 1954 when deliveries were delayed in various parts of the state. To the best of our knowledge, however, no construction that was scheduled for 1954 has been deferred due to inability to secure cement. There was some out-of-area cement used at a few scattered points, but in general the demand was supplied by local producers."

A producer in the Missouri River Valley says: "There has been some shortage of cement in our marketing area during the fall months both in 1953 and 1954, and there has been some absorption of freight to meet *bona fide* competition at the markets."

Several producers farther east said that there has been some absorption of freight cost to meet competition but it has been very limited in extent.



Marquette's Superior, Ohio, plant with new crushing department and the 1800-ft. conveyor system in foreground.

CHANGES IN OWNERSHIP

There were several changes in ownership in 1954 among cement plants and companies in the United States and its possessions, and a few other changes, one of major proportions, are said to be on the verge of completion. In line with the trend in the other nonmetallic minerals industries and in industry in general, several of the changes were absorptions by large companies of small independent operators. This is a trend which is expected to continue as it is the most economical way to add capacity with the present high cost of building new plants. Several large producers have publicly proclaimed their readiness to take prompt advantage of any such opportunities which may present themselves.

In a transaction closed at the end of December, 1953, the Allentown Portland Cement Co., Allentown, Pa., took over the business and property of the Valley Forge Cement Co. at West Conshohocken, Pa., and now operates this as its Valley Forge plant. Since this plant was built in 1926 its total output has always been sold by Allentown. Allentown Portland also operates a cement plant at Evansville, Pa.

The Ideal Cement Co. recently further expanded its area of operations when it took over the plant of the Spokane Portland Cement Co. at Irvin, near Spokane, Wash. It is reported that the price was $1,600,000. The output of the Spokane plant is 650,000 bbl., bringing Ideal's total output to about 21,000,000 bbl. annually.

Ideal has recently purchased for $1,200,000 the Federal Government's experimental alumina plant at Laramie, Wyo. It was announced that the production of lightweight aggregate for concrete would begin soon. It was at one time rumored that this plant might be converted to cement manufacture.

Late in the year the Penn-Dixie Cement Corp. announced that it had purchased the Petoskey Portland Cement Co., with a plant at Petoskey, Mich., and the Petoskey Transportation Co. This acquisition added about 1,600,000 bbl. of capacity to Penn-Dixie's present 11,300,000 bbl. (8 plant) capacity. A $1,000,000 plant modernization and expansion program will be started immediately. The Michigan companies will now operate under the Penn-Dixie name.

Early in 1954 controlling interest in the Keystone Portland Cement Co., Bath, Pa., was purchased by a group of investment bankers headed by Shields & Co. It is reported that 60 percent of outstanding shares was obtained.

METHOD OF SHIPMENT

The trend toward truck shipment of cement continued at an unabated pace in 1954, according to reports from producers in all parts of the country. There were several areas in the Middlewest, however, where this trend is apparently being reversed to some extent, with railroad shipments gaining over truck shipments. A reduction in railroad freight rates is given as the reason.

One Ohio producer says: "About the only noticeable trend during 1954 has been to a greater use of bulk cement and less shipping in paper bags. Also it seems railroads have reduced freight rates and there seems to be a tendency toward car shipments rather than truck shipments. Manufacturers in this area have shipped the greater portion of their production in the past several years by truck and now it seems to be swinging the other way."

A mid-South producer says: "The trend toward truck shipments has been considerably arrested of late by a lowering of railroad rates. Truck deliveries are still preferred in many instances on account of convenience, but we think that in the end deliveries are likely to be rather evenly balanced between railroad and truck."

Exactly opposed to these reports is the statement of a Michigan producer who says: "As far as truck shipments go this state has been trucking heavily for 20 years or more, and it will continue to do so." A New York producer reports a continuing demand for truck delivery where economical, for the handling of which special facilities were recently added.

From Texas comes the report that: "During the past year the trend toward truck shipments, both in bulk and package, has been steadily upward. We are presently shipping approximately 80 percent of our production via trucks."

Another says: "Concerning trucking to customers, we handle this end of the business through a trucking contractor. It is frankly a headache but it looks as if we are saddled with it for some time to come. Our monthly shipments vary from 68 to 74 percent on disbursement of truck over rail."

There has apparently been a continuation of the trend toward bulk shipment of cement especially in the

Middlewest and West. A producer in the Pacific Northwest said that: "There has been a gradual increase in the percentage of our shipments which are being taken in bulk. It is believed this trend will continue."

MISCELLANEOUS

According to one producer not now making that product, "Slag portland cement has been produced by two manufacturers who serve parts of Ohio. Both have been successful in promoting its use for pavements, which might be considered indicative of eventual general acceptance. Its use may develop in those areas where cement is manufactured and where slag is available at extremely low cost, and it could be a means of increasing cement supply in those restricted areas."

Another company which does make slag portland cement also believes that this product will be the means of increasing the cement supply.

PLANT EXPANSIONS

Aetna In March, 1954, the Aetna Portland Cement Co. completed an expansion program at its Bay City, Mich., plant which added 500,000 bbl. of annual capacity for a total of 2,200,000 bbl. This project included the installation of a new 10- by 175-ft. kiln (for a total of four), a waste-heat boiler, a grate-type clinker cooler, a 7- by 26-ft. raw mill, a 9½- by 16-ft. finish mill, and other equipment. During the summer some new and larger slurry tanks were built and four new 6,000-bbl. silos have just been completed. Another grinding mill will be ready early in 1955, and one of the old boilers will be replaced by a new one.

Alpha The Alpha Portland Cement Co. in 1954 completed improvements to its Birmingham, Ala., plant which increased its productive capacity 20 percent. A rehabilitation program is now under way at the Catskill, N. Y., plant which will increase its capacity by 40 percent. This program, to be completed in 1955, includes replacement of the aerial tramway from quarry to plant by a 1-mile conveyor system.

Ash Grove The Ash Grove Lime & Portland Cement Co., with plants at Chanute, Kans., and Louisville, Nebr., is reported to be planning additional refinements in its process of manufacture and machinery replacements, with some additional production. It is rumored that this will include a new kiln and several mills.

Bessemer The Bessemer Limestone & Cement Co. recently announced an extensive expansion program for its plant at Walford Station, Pa. A large new kiln will be installed, and more grinding facilities will be added.

Calaveras Early in 1954 the Calaveras Cement Co. announced an improvement program calling for the expenditure of nearly half a million dollars during the year for the modernization of its plant at Calaveras, Calif., and the continuation of its long-range quarry development program. An interesting step was the installation of a Bucyrus-Erie rotary drill, the first of its kind in the West.

Although the capacity of this plant has already been expanded 200 percent since World War II, an expenditure of $623,758 during 1955 for plant betterment has been approved.

California-Arizona The Arizona Portland Cement Co., a subsidiary of the California Portland Cement Co., during 1954 continued the long-range expansion program at its Rillito, Ariz., plant. By July, 1955, Arizona Portland is scheduled to complete the installation of a 335-ft. F. L. Smidth kiln, grinding equipment and storage facilities, thereby increasing its capacity by 3,000 bbl. per day to a total of 7,000 bbl. daily or 2,500,000 bbl. annually. This plant began operation in 1949 with a single 335-ft. kiln, and a second similar kiln was added in 1951. The power plant will also be enlarged.

The California Portland Cement Co. early in 1954 announced plans for a new $12,000,000 plant to be built near Mojave, Calif. Contracts have now been let for this 6,000-bbl.-per-day dry-process plant, and completion is scheduled for August, 1955. Equipment will include two 12- by 11- by 350-ft. Allis-Chalmers kilns and five 10½- by 17-ft. ball mills.

Consolidated The Consolidated Cement Corp. recently announced that it is undertaking a major rehabilitation and expansion program at its Fredonia, Kans., plant. Equipment to increase the plant's capacity by 1,300,000 bbl. to 2,300,000 bbl. annually has been contracted for and work is under way. Included will be a new 425-ft. kiln, additional grinding equipment, etc. This program is expected to be completed about September 1, 1955.

Dewey The Dewey Portland Cement Co. in 1954 made a number of additions to its plant at Dewey, Okla. A new 10- by 18-ft. air-swept tube mill was added, dust collectors were installed on the rock driers, and a new coal drier, complete with dust collectors, was installed.

At its Davenport, Iowa, plant Dewey took a breather after its extensive expansion program completed in 1953. In 1949 an 11- by 375-ft. kiln was installed along with other equipment. The second phase of the program consisted of two more 11- by 375-ft. kilns, conversion from waste heat to purchased power, eight new cement silos with a capacity of 231,000 bbl., quarry improvements, etc. In 1954 several new cement barges were added and some minor improvements were made.

No further plans have been announced for the distributing plant at St. Paul, Minn., which was proposed in 1952.

Dragon The Dragon Cement Co. in 1954 completed a program of modernization and improvement of its manufacturing facilities started 10 years ago. Extensive work was done at both its Thomaston, Maine, and Northampton, Pa., plants. Outstanding during 1954 was the installation of five new and almost completely automatic grinding mills at Northampton.

Federal The Federal Portland Cement Co., Inc., continued to improve and enlarge its plant at Buffalo, N. Y., in 1954. A new finish mill and building and slurry tanks were erected, and the electrical system was improved. Under construction at the present time are additional storage silos with 155,000-bbl. capacity. Other improvements and expansions are planned.

General The Florida Portland Cement Division of the General Portland Cement Co. early in 1954 completed the second enlargement of production facilities in five years at its Tampa, Fla., plant. Capacity has been increased from 1,500,000 bbl. at the end of World War II to 4,000,000 bbl. annually. The first expansion project (completed in 1949) included a new 426-ft. kiln and grinding equipment. Another kiln of the same size was recently added.

The Trinity Cement Division of General in 1954 carried on an expansion program at its Houston, Tex., plant scheduled for completion early in January, 1955. This added 1,250,000 bbl. to the plant's capacity. The combined programs at these two plants cost over $4,000,000.

General recently announced that its (Trinity) Dallas, Tex., operations

are again being expanded, this time by 1,250,000 bbl. annually. New facilities will include a 425-ft. kiln and additional grinding facilities. This program is expected to be completed in July, 1955.

The Signal Mountain Division of General at Chattanooga, Tenn., is to get a new 11¼- by 425-ft. kiln.

Giant The Giant Portland Cement Co., with plants at Egypt, Pa., and Harleyville, S. C. (Carolina Giant Cement Co.), reports no major improvements during 1954 but is attempting to carry out a modest program of plant rehabilitation with the twofold objective of increasing productivity and realizing some cost reduction.

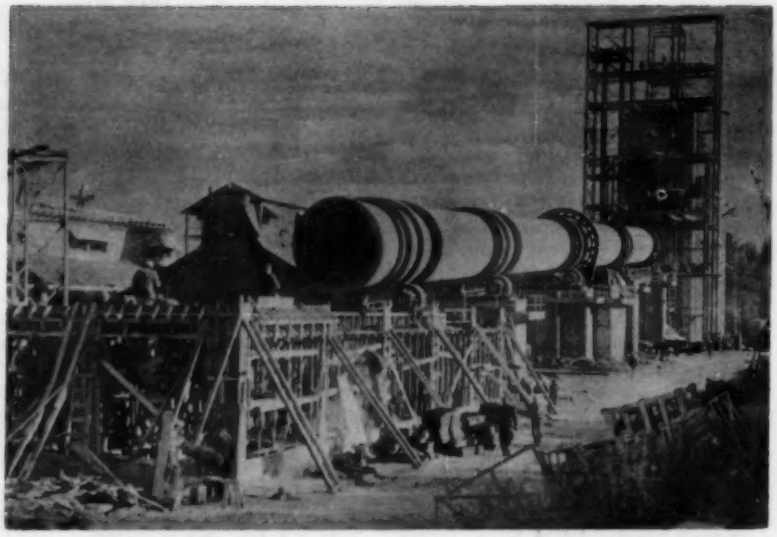
Halliburton The Halliburton Portland Cement Co., which built a new cement plant at Corpus Christi, Tex., several years ago, is reported planning to build two new 2,500-bbl. plants in Arizona —one at Phoenix and one at Clarkdale. The limestone for both plants will be obtained at Clarkdale, and ground limestone slip will be pumped 110 miles through a pipeline to the Phoenix plant.

At the Corpus Christi plant a new bulk-truck-loading station was built in 1954. Construction is under way on a new floating shell washing and classifying plant, and additional bulk-truck-loading facilities will be installed.

Huron During 1954 the Huron Portland Cement Co. increased its capacity about 25 percent by the installation of four new 10- by 153-ft. Allis-Chalmers kilns and corresponding increases in raw- and finish-grinding capacity. Two new 9- by 15-ft. ball mills make a total of 11 raw mills. Two new 8- by 37-ft. finish mills make a total of 23 finish mills now in use. The clinker storage was relocated by the addition of a new 2,000,000-bbl. storage. Reclaiming is through a 600-ft. concrete tunnel under the storage.

The Alpena, Mich., plant now has a clinker production capacity of 9,000,000 bbl. annually, or 26,000 bbl. daily, and the finish-grinding capacity there and at the Superior, Wis., grinding plant combined is 38,500 bbl. daily.

It is expected that plans now approved and under way will increase capacity by another 1,000,000 bbl. annually during 1955. Installations will include a new bin system for coal for kiln firing, redesign of the entire kiln firing system, and preheaters on at least two of the kilns.



The new 12- by 380-ft. kiln and other facilities being installed at Marquette's (Southern States) plant at Rockmart, Ga.

Ideal Again in 1954 the Ideal Cement Co. kept its capital expenditures comparatively low after one of the most extensive expansion programs (completed in 1952) ever undertaken by any cement company. Improvements and expansions for a number of its plants are being considered. The present program calls for the expenditure of $5,500,000, chiefly for added cement storage capacity at the Mobile, Ala., Baton Rouge and New Orleans, La., and Houston, Tex., plants.

Much work of a general nature was done in 1954, including the installation of an additional finish-grinding mill at the San Juan Bautista, Calif., plant.

No plans have yet been announced for the Irvin, Wash., plant of the Spokane Portland Cement Co., recently taken over by Ideal.

It was recently announced that Ideal has acquired an industrial site near Vancouver, B. C., and options on nearby limestone properties, with a view to further expansion into the Northwest and British Columbia.

Kosmos In 1954 the Kosmos Portland Cement Co., Kosmosdale, Ky., added a 5,000-kw. turbine in its power-house and converted from 480 v. to 4160 v. An additional kiln is now being installed and will be in operation about the middle of 1955. There are plans for a further moderate increase but these are not yet definite.

Lehigh The big news for 1954 as far as Lehigh Portland Cement Co. is concerned is the multi-million-dollar expansion program at its Bunnell, Fla., plant which was announced in the summer of 1954. The original wet process plant, completed in December, 1952, at a cost of $15,000,000, had two 10½- by 380-ft. kilns and a capacity of 1,400,000 bbl. It was designed by F. L. Smidth & Co., which also supplied most of the equipment. The present program will increase capacity by 80 percent and will be completed in the summer of 1955. Another 10½- by 380-ft. Smidth kiln and three Unidan mills are to be installed.

Lehigh has just announced a $15,000,000 expansion project at its Union Bridge, Md., plant which will make it one of the company's largest. When this program is completed late in 1956, this plant will have a capacity of over 3,000,000 bbl. annually. This work will be expedited without interfering with current output. This is the seventh major project in Lehigh's post-war expansion program; when completed, it will bring total annual capacity to 26,500,000 bbl., an increase of 7,200,000 bbl. since the close of World War II.

Lone Star The Lone Star Cement Corp. in 1954 took a breathing spell between its extensive expansion program completed in 1953 and another one just announced. The 1954 work completed included new 100,000-bbl. cement silos at the New Orleans, La., plant, the installation of additional grinding equipment and other machinery for special cements at the Dallas plant, and additional dust collecting equipment at practically all plants.

The new program recently announced and already under way will require an expenditure of $14,200,-

000 in the next two years and will increase Lone Star's capacity at its 18 plants by 1,660,000 bbl., to a total of 35,660,000 bbl. annually. This will mean that in the decade since the close of World War II productive capacity of the Lone Star system will have been increased by 42.6 percent, or a total of 10,660,000 bbl. During this period total expenditures for improvements will have been about $85,000,000, over and above normal expenditures to maintain plants in peak operating condition.

This $14,200,000 program will include the remodeling and enlarging of Lone Star plants at Greencastle, Ind., Nazareth, Pa., and Bonner Springs, Kans., and this work will be handled piecemeal, so as not to interfere with production.

Actual construction now under way at Greencastle will increase the capacity of that plant by 600,000 bbl. to a total of 2,600,000 bbl. annually. This program includes the installation of a fourth kiln—a 10- by 240-ft. F. L. Smidth unit—with necessary auxiliaries, a coal mill, addition to the finish mill, additional storage and loading facilities, and power transmission improvements.

The work at the Nazareth plant will include an additional kiln and auxiliaries, a new crushing plant, a raw- and finish-grinding installation, additional raw-blending tanks, an electrical precipitator system, etc.

At Bonner Springs, in addition to the new kiln, there will be added a new raw ball mill, a coal mill, a clinker grinding mill, slurry tanks, etc.

Marquette The Marquette Cement Mfg. Co., which on January 1, 1954, took over the Superior Cement Division of the New York Coal Co. and its plant at Superior, Ohio, and the Southern States Portland Cement Co. and its plant at Rockmart, Ga., immediately announced that both plants would be substantially improved at a total cost of $3,580,000. Later details of a long-range improvement program for the Superior plant include conversion from underground to open-pit mining, using a walking dragline with a 140-ft. boom for stripping; an 1800-ft. conveyor system connecting the new three-unit crushing department with the cement plant; a new packing department; dust collectors; feeders; a new raw grinding department, etc. These changes are expected to increase the plant's 800,000-bbl. capacity to 1,000,000 bbl. annually when it is completed early in 1955. Revamping of the kilns is planned for a later date.

At the Georgia plant $1,500,000 is to be spent, according to a recent announcement, chiefly for a new 12- by 380-ft. kiln and related equipment and the construction of new cement storage and packing facilities. The kiln is expected to be in operation early in 1955. About $1,300,000 additional is to be spent in 1955 for minor improvements at the company's other plants.

Marquette recently authorized an additional expenditure of $1,300,435 for an expansion program that includes additions and improvements to its cement plant at Cowan, Tenn., and conversion of its Memphis gravel plant into a sand plant. The extent of the expansion at the Cowan plant was not specifically stated.

Medusa The Medusa Portland Cement Co. is reported to have well under way an improvement and expansion program to cost several million dollars at its York, Pa., grey cement plant. The program includes modernizing all plant facilities, and especially improving and enlarging the plant and quarry. The present 600,000-bbl. annual capacity of this plant is expected to be approximately doubled when this work is completed in the latter part of 1955.

It was recently announced that Medusa is planning to spend $25,000,000 over the next five years for plant expansion.

Missouri The new 1,200,000-bbl. plant of the Missouri Portland Cement Co. at Sugar Creek (near Independence, Mo.), is reported to have gone into operation a few months ago. This plant has an 11-ft. 3-in. by 350-ft. Smidth kiln and Nordberg raw and finish mills. The Macdonald Engineering Co. had the contract. Recent information indicates that the old plant if replaced will be dismantled.

It was recently reported that Missouri has ordered a third kiln for its plant at Prospect Hill (near St. Louis, Mo.), which went into operation in 1950. This 12- by 450-ft. Allis-Chalmers kiln and its 6- by 100-ft. air-quenching cooler will add 1,350,000 bbl. per year to the capacity of this plant. Cement storage is being expanded with ten new silos of 160,000 bbl. total capacity. When completed, this plant will have a capacity of 4,800,000 bbl. annually.

Monarch The Monarch Cement Co., Humboldt, Kans., in 1954 continued its impressive program of plant improvement and expansion. In 1954 a new shale drying and crushing plant was completed at a cost of $750,000. This is reported to have cut shale processing costs in half. Other major improvements planned include a new rock-crushing plant and a new 7500-kw. power plant.

Monolith During the summer of 1954 the Monolith Portland Cement Co. reported that it had under way at its Monolith, Calif., plant an expansion program which would increase its capacity over 1,000,000 bbl. annually. The equipment being added was reported to include a 12- by 130-ft. slurry drier, a dust collector, and several additional kilns. The drier was to be installed on an existing kiln. This program was scheduled for completion late in 1954.

North American The North American Cement Corp., early in 1954 started an expansion program at its Howes Cave, N. Y., plant which is designed to increase its capacity 1,500 bbl. to a total of 4,500 bbl. daily. The first phase of the program is the installation of a fourth kiln and the enlargement of the kiln building. Other work includes the addition of new coal mills, clinker coolers, dust collectors, etc. The quarry facilities are also being expanded. Raw mill expansion includes a new Traylor ball mill. New finish-grinding facilities and raw material and cement storage expansion are also planned.

Northwestern Portland The Northwestern Portland Cement Co. late in 1954 completed a $350,000 limestone quarrying and crushing development at Soda Springs, Wash., to supply raw material for its plant at Grotto. The plant consists of two crushers, a conveyor system, and truck-loading bins.

Northwestern States The Northwestern States Portland Cement Co., Mason City, Iowa, is reported to have completed the modernization of its kiln department. A new kiln and cooler were installed, as well as some grinding equipment. It is rumored that three additional kilns and other units of equipment are being installed.

Oregon The Oregon Portland Cement Co., in 1954 completed a $1,000,000 quarry expansion and improvement program at its Lime, Oreg., plant. The kiln firing system was also modernized. The quarry expansion program was made with a view of adding another kiln as soon as market conditions in

eastern Oregon and western Idaho warrant. A clinker mill was also added at the Oswego, Oreg., plant.

Penn-Dixie At the beginning of the year the Penn-Dixie Cement Corp. was reported planning capital expenditures of over $1,500,000 in 1954, but no details are available. A 210,000-bbl. cement storage has just been completed at the Kingsport, Tenn., plant.

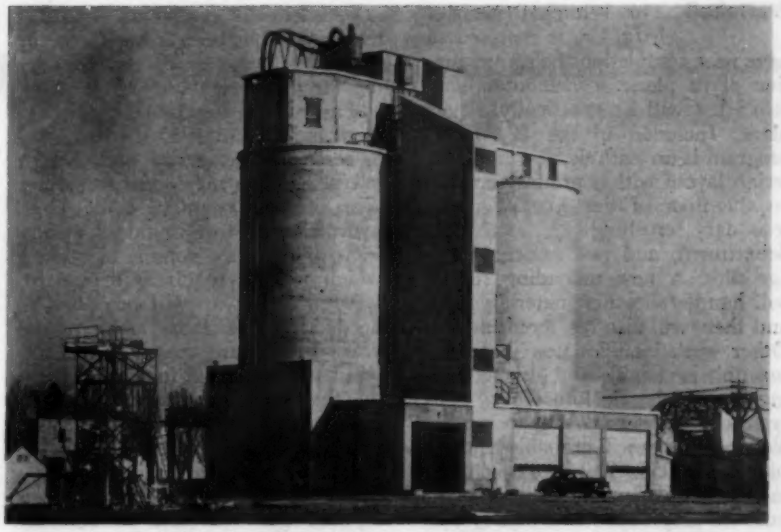
Late in the year Penn-Dixie purchased the Petoskey Portland Cement Co. which has a plant at Petoskey, Mich., and the Petoskey Transportation Co. This transaction added 1,600,000 bbl. to the present (eight-plant) capacity of about 11,300,000 bbl. A $1,000,000 plant modernization and expansion program was immediately announced which includes the installation of new crushing equipment, coolers, and quarry improvements. The Michigan company will now operate under the Penn-Dixie name.

Permanente Again in 1954 the Permanente Cement Co. made no important changes in its cement plant at Permanente, Calif. Early in the year its 58,000-bbl. bulk cement vessel, the *S. S. Permanente Silverbow*, was put back into service. The ship, damaged last winter in a collision at sea, was repaired and overhauled at a cost of over $350,000. Late in 1954 Permanente opened a new bulk cement distribution plant at East Pasco, Wash. Cement is brought in special barges up the Columbia River from the company's Portland, Oreg., distributing plant.

It is rumored that plans are being made for the construction of a new plant at Fontana, Calif., to utlize the slag from the Kaiser steel mill there.

Pittsburgh Coke & Chem. The Green Bag Cement Division of the Pittsburgh Coke & Chemical Co. reports no major improvements in 1954. It is, however, beginning a study of its cement plant at Neville Island, Pa., which will take in all phases of production. When this study has been completed, decisions will be made on what is to be done on expanding and modernizing the plant.

Riverside The Riverside Portland Cement Co. continued to improve its plants during 1954. At the Oro Grande, Calif., plant the $4,000,000 new waste-heat power plant now nearing completion is expected to effect a 50 percent reduction in dust loss. Dust collection equipment has been greatly improved and modernized, and a comprehensive plant beautification program is under way. Plans have also been made to enlarge rock storage and crushing facilities, as well as cement storage facilities. The highway fleet has been further expanded by the addition of four Utility dual-purpose rigs. These units make possible nearly full truck utilization, since they haul bulk cement out and fuel oil back on each leg of a round trip from Oro Grande to the Los Angeles area.



The new bulk-loading plant of the Canada Cement Co. at Toronto, Ont.

At the Crestmore, Calif., plant substantial improvements and capacity increases are being made in the power house. During 1955 it is planned to begin obtaining limestone for this plant by underground mining. The room-and-pillar system will be used instead of block caving as heretofore, and the necessary pumps, compressors and other equipment have already been acquired. A series of 200- by 50- by 90-ft. rooms will be mined on three 30-ft. benches.

Southern The Southern Cement Co. early in 1954 put into operation a new 1,000,000-bbl. cement plant at Roberta, south of Birmingham, Ala. Plans are now being made for the further expansion of this plant over a one- to two-year period.

Southwestern The Southwestern Portland Cement Co. early in 1954 completed another phase of the long-range improvement program which has been under way at its Victorville, Calif., plant for several years. This latest development involved raw material supply, preparation, and storage; the principal features being the opening of a new quarry, a new kiln, and a modern, new high-capacity crushing plant at the quarry.

Universal Atlas The Universal Atlas Cement Co. has made satisfactory progress with the rebuilding of its plant at Universal, Pa., which should be in full operation by the middle of 1955. This program, started in 1912, called for the replacement of three departments—raw material storage and grinding mills, kilns, and clinker grinding, in that order. The result will be essentially a complete new plant. Two 11- by 360-ft. Smidth kilns were installed.

Late in 1954 Universal Atlas announced plans to increase the capacity of its Fairborn, Ohio, plant by one-third. This program will include expansion of the finished cement storage, the addition of a new kiln, and other work. The Independence, Kans., plant will be improved by the installation of a new crushing plant and raw materials storage and the modernization of the drying and blending facilities.

A few weeks ago plans were announced for the construction of a new 3,000,000-bbl. plant adjacent to the existing plant at Buffington, Ind. This will give operations there an annual capacity of over 10,000,000 bbl. An associated project consists of a new clinker-grinding plant and related facilities at Milwaukee, Wis., where the company now has a bulk and package loading plant. Cement clinker will be shipped by lake boats from Buffington to Milwaukee and there ground into finished cement, which will be available on a year-round basis. Shipments of finished cement to Milwaukee are now limited to about 8 months of the year, due to ice on Lake Michigan.

Whitehall The Whitehall Cement Mfg. Co. is reported to have near completion the reconstruction of its plant at Cementon, Pa., into what will be practically a new plant. Included in the $2,400,000 program is an entirely new raw materials layout with a primary crusher on the floor of the quarry, a new secondary crushing and screening department, and raw material storage silos. A new unloading station will handle all other materials used, and these will also be stored in silos. Other work includes new direct-firing unit coal mills and the rebuilding of the electrical facilities. Concrete cement storage silos to replace old stockhouses will probably be completed in 1955. This work will not increase the capacity of this plant but will improve the efficiency and economy of operation. Plans for future work involve expansion of capacity.

CANADA OUTPUT TOPS 1953 RECORD

OFFICIAL government reports on Canadian cement production are available only through October, 1954. At the end of that month production had reached 18,993,873 Canadian bbl. (350 lb.) compared to 18,676,257 bbl. up to the end of October, 1953. Production is now at the rate of about 2,100,000 bbl. per month and information indicates that all plants are working at capacity. No information is yet available on shipments but these are also believed to be ahead of 1953, when the total was 22,224,314 bbl. The 1953 shipments were 20 percent above the 1952 total and nearly three times the 1945 shipments.

Imports up to August 31, 1954, amounted to 1,105,451 bbl. as against 1,525,082 bbl. in the same period in 1953. Exports up to the end of October, 1954, amounted to 117,222 bbl., compared to 14,332 bbl. in the first ten months of 1953.

Producers report several factors acting as deterrents to progress by the industry, including high freight rates, high taxes and rising labor costs. These factors are said to have been reflected in increasing threats to the cement industry by other competitive materials from both inside and outside the country.

There is some indication at the end of 1954 of more than a seasonal falling off in business. Actually large users of cement for National Defense projects are tapering off their requirements while at the same time the great hydro-electric power development at Niagara Falls, Ont., is now practically completed. The latter project has been a big factor in the heavy demand for cement during the past few years.

The outlook for the Canadian cement industry in 1955 is still felt to be reasonably reassuring even though overproduction may occur in certain parts of the country. Some large hydro-electric work is under way and some of the huge volume of cement which will be required for the St. Lawrence Seaway will probably be needed by the latter part of the year. It appears that the industry will have to depend for sales in 1955 on the general building program, power projects still uncompleted and new work that develops during the year.

The capacity of the cement industry was again increased considerably in 1954, chiefly by the construction of one new plant in eastern Canada (St. Lawrence) which added 1,500,000 bbl. annually to capacity. According to reports considerably more capacity will be added in 1955. A complete new plant and a new clinker and cement distributing plant (Canada Cement) in western Canada will add 2,600,000 bbl. of new capacity. Another new plant (Belgique) in that area is planned for completion in 1956. Other new plants are in the rumor stage.

Belgique According to a recent announcement by the Canadian Government a multimillion-dollar cement plant is to be built in the Edmonton, Alberta, area with European financial backing. Le Societe Generale de Belgique of Brussels, Belgium, will build the plant; it is expected to be in operation by 1956. Raw materials will come from limestone deposits in the Cadomin area, 160 miles southwest of Edmonton. The only other cement plant in Alberta is operated by the Canada Cement Co. at Exshaw, near Calgary.

Canada Cement The Canada Cement Co. Ltd., largest producer of portland cement in Canada, in 1954 completed another large construction program and has projected considerable new work into 1955 and later. In eastern Canada, construction of new packing facilities at its warehouses in Toronto, Ontario, and Quebec City, Quebec, were completed to expedite the handling of shipments both in bulk and in bags.

Under way for completion in 1955 is an expanded clinker grinding plant at Belleville, Ontario, and new enlarged packing and shipping facilities at the Montreal East plant.

In August, 1954, the Canada Cement Co., announced that preliminary work had started on a new 1,000,000-bbl. clinker grinding and cement shipping plant in Edmonton, Alberta. This was said to be scheduled for completion during 1955 and was designed in such a way as to eventually become a complete portland cement manufacturing plant. In the meantime clinker was to be shipped to Edmonton from the company's plant at Exshaw.

The Canada Cement Co. also has under construction at the present time a completely new wet process cement plant at Fort Whyte, near Winnipeg, Manitoba. This is in addition to the existing plant and will double the present capacity of 1,600,000 bbl. annually when it is in operation early in 1955. Equipment includes a new 12- by 450-ft. F. L. Smidth kiln as well as crushing and grinding machinery, work mills, etc.

Ideal The Ideal Cement Co., Denver, Colo., recently announced the acquisition of an industrial site near Vancouver, B.C., and options on nearby limestone properties, with a view to further expansion into the Northwest and British Columbia.

International According to recent reports, British Columbia may get a second cement plant at Chilliwack on the Trans-Canada Highway. This plant is proposed by the International Cement Corp., a subsidiary of C. F. McDougall Associates of Dallas, Texas.

Ciment Quebec Ciment Quebec, Inc., which late in 1951 put in operation an 800-bbl. per day new wet process plant at St. Basile, Quebec, later installed additional equipment to increase its capacity. In 1954 the plant was further improved by the installation of a new 8- by 41-ft. raw Compeb mill, a 25-ft. wide by 200-ft. long slurry basin with an F. L. Smidth traveling agitator, another bagger and other equipment. Future plans call for a new 8- by 41-ft. clinker Compeb mill, two more baggers, and a bank of cement storage silos.

St. Lawrence The new $11,000,000 plant of the St. Lawrence Cement Co., at Villeneuve, a suburb of Quebec, is reported to be completed. It is owned by Swiss interests and will have a capacity of over 1,500,000 bbl. annually. The installation includes a pier on the St. Lawrence River for water shipments and a 400-ft. stack which is said to be the largest serving any cement plant in North America.

Review

Aggregate Industries—and Forecast

1954 — Peak Year for Aggregates

Producers optimistic for 1955

By KENNETH A. GUTSCHICK

PARALLELING the record construction volume attained in the United States in 1954, the production of crushed stone and sand and gravel reached all-time highs in that year, and 1955 promises to be another record year for both industries. These optimistic statements are based upon a comprehensive survey conducted by PIT AND QUARRY during the closing weeks of 1954. As in past years, detailed questionnaires were sent to hundreds of aggregate producers from all sections of the country, and the production performances as reported for 1952, 1953, and 1954 were compared with the latest known production data reported by the Bureau of Mines (1952).

On the basis of these comparisons, it appears that sand and gravel production (both commercial and noncommercial) gained nearly 4 percent in 1953 over 1952, thereby reaching 454,000,000 tons, and gained an additional 3 percent in 1954, reaching 468,000.000 tons. From evidence available at the time of this writing, it seems likely that 1955 output will continue to rise and perhaps top the 475,000,000 ton mark.

Crushed stone output likewise showed important gains in the last two years. The indication is that 1953 production exceeded the 1952 total of 298,791,340 tons by nearly 3 percent, thereby attaining 307,000,000 tons, and that a further increase of 1 percent was shown in 1954, bringing the total to about 310,000,000 tons. The outlook for 1955 indicates that production will continue to rise, perhaps gaining an additional 1 to 3 percent.

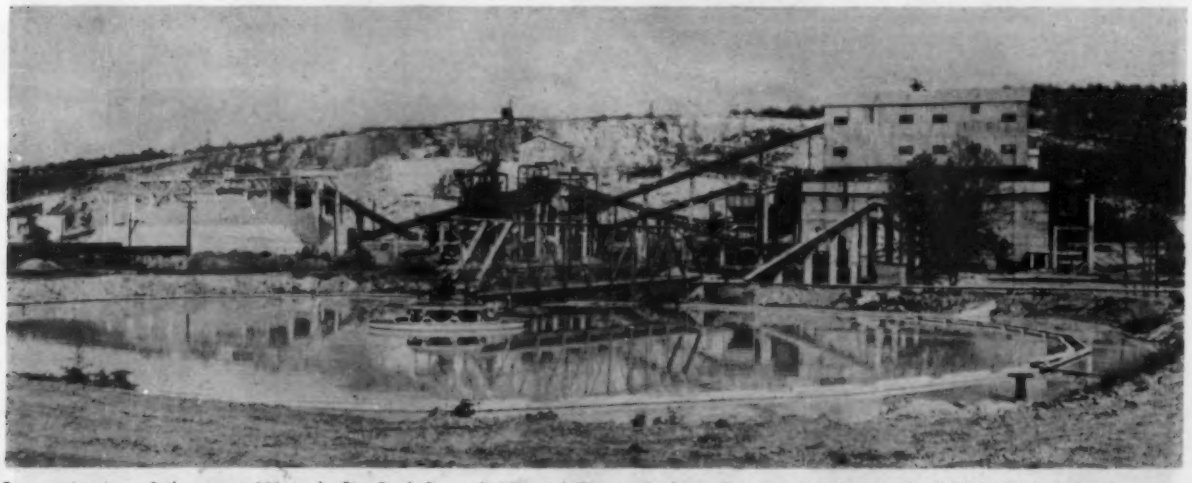
The impressive performance of both industries in 1954 is correlated with the record achieved by the construction industry, particularly with regard to road building and other heavy construction, as well as housing. The record for the crushed stone industry is particularly noteworthy in view of substantial decreases during 1954 in the consumption of fluxing stone, dolomite for refractory purposes, and agricultural limestone. The drop in metallurgical production is closely tied in with the poor year for the steel industry productionwise. Factors accounting for the relatively low agstone output will be discussed later.

Besides requesting information on production, our questionnaires solicited other valuable data, including current and 1953 data on selling prices, hourly capacity, and wages. In addition, producers were asked to report on expected business conditions in 1955, pinpointing in particular the probable effect of President Eisenhower's proposed $50 billion highway program. Plans concerning plant expansion, modernization, and new plant construction in 1955 were also requested.

The returns were very satisfactory, both from numerical and regional viewpoints. Actually about 10 percent of the total sand and gravel output and 15 percent of the total crushed stone output was represented. On this basis it appears that important generalizations can be drawn.

SAND AND GRAVEL

According to the survey, the record volume estimated for 1954 (468,000,000 tons) is accounted for largely by major gains reported by both Western and Southern producers, who showed 10 and 7 percent increases over 1953, respectively. The Midwest section gained 3 percent, while the East dropped about



Panoramic view of the new 1,000 t.p.h. Big Rock Stone & Material Co. crushed syenite operation just south of Little Rock, Ark.; the plant can produce 2,500,000 tons a year. In the foreground is the 140-ft. dia. thickener, with the huge surge pile on the left, the finish mill building on the right, and the syenite quarry in the background. The operation features jet piercing.

6 percent. Comparing 1953 with 1952 on a geographical basis, gains were reported in the East (5 percent), the Midwest (2 percent), and the West (3 percent); the South on the other hand showed a drop of about 2 percent.

Hourly Capacity Data on plant capacity in tons per hour for both November, 1954, and November, 1953, were requested. These averages are reported here to point out certain trends, and are not to be taken as representative of an overall average.

For all producers reporting for both years the average capacity increased from 123 t.p.h. to 137 t.p.h. during the year interval or a rise of about 11 percent. Changes by geographic sections were: East—up 6 percent (from 124 to 131 t.p.h.); South—up 7 percent (from 70 to 75 t.p.h.); Midwest—up 8 percent (from 140 to 151); and West—up 17 percent (from 101 to 118 t.p.h.).

Eighty-eight percent of the plants answering reported having sand and gravel washing facilities, with nearly all of these plants reporting washing 100 percent of the finished product. A breakdown by section revealed that 86 percent of the Eastern plants reporting had washing facilities, 92 percent — South, 89 percent — Midwest, and 66 percent—West.

Interesting data was gathered on total months operated per year. The average figure obtained was 9.8 months. Broken down by sections, the data was as follows: South—11.9 months; West—10.8; East—9.7; and Midwest—9.2.

Selling Price The survey data indicates that the average selling price for both sand and gravel remained practically stable during the year interval, with sand increasing 1 cent to $1.02 per ton and gravel increasing 2 cents to $1.33 per ton. A breakdown by sections shows that sand prices increased 4 cents per ton in the West (to $1.43); 3 cents in the East (to $1.00); and one cent each in the South (to $1.06) and Midwest (to $0.96). Gravel prices remained the same in the West (at $1.56) but increased by four, three, and two cents per ton, respectively, in the East (to $1.46), South (to $1.40), and Midwest (to $1.24).

Wages Significant wage increases characterized the sand and gravel industry in 1954, thus continuing the trend of recent years. The average hourly wage increased from $1.51 to $1.58 during the year period, with 11 and 10 cent increases characterizing the West (to $2.07) and East (to $1.60), respectively. A gain of 4 cents was reported in the South (to $1.18) and 6 cents in the Midwest (to $1.56). In addition to wage increases, many producers reported granting increases in fringe benefit payments.

The survey for the first time provided data on number of employees. Accordingly an average of 20 employees was reported per plant. (One Midwestern firm operating 12 plants reported 980 employees on its payroll). The average by sections varied from 16 per plant in the South to 25 in the West.

Outlook In order to ascertain the business outlook for 1955, the producers were asked to predict the percentage change in demand for their product. Summarized results indicate that 1955 should be another banner year. This note of optimism is based on the fact that 41 percent of the producers predicted an increase in business, 46 percent expect the demand to remain the same, 3 percent expect a decline, and 10 percent express uncertainty. Thus nearly 90 percent of the producers reporting expect the business in 1955 to increase or remain the same. Individual increases ranged from 5 percent to 30 percent, with 15 percent representing the average.

An analysis of the business outlook by sections indicates that all sections expressed optimism, with the South perhaps showing the most and the West the least. Much of the optimism was apparently based on an expected general increase in highway building, part of which is explained by the increasing interest shown in this field by the U.S. Government.

Information supplied by producers concerning plant expansion and new plant building bore out their optimistic view point. More than half of the producers expressed plans for making one or more major changes in either their pit or plant set-up. Eight percent reported plans to build new plants in 1955, and eight percent plan to open up new deposits. About 25 percent expect to add new pit or processing equipment, and another 25 percent expect to revamp their pit or processing operations.

A beautiful panoramic view of New York Trap Rock's quarrying operation at Haverstraw, N.Y., located along the Hudson River. In 1954 the firm completed a major modernization program, in which a new primary crushing station (foreground) was erected at grade with a new third level operation (far right). A two-stage belt conveyor, more than 1,100 ft. long, following the curvature of the slope, leads to the secondary crusher building.

1952 Statistics In 1952, the latest year for which the Bureau of Mines has published production statistics, sand and gravel output totaled 436,517,000 tons, valued at $353,699,000. This was 9 percent greater in quantity and 6 percent higher in value than in 1951. Approximately 69 percent of the output came from commercial operations, the balance from federal, state, county, and municipal governmental operations.

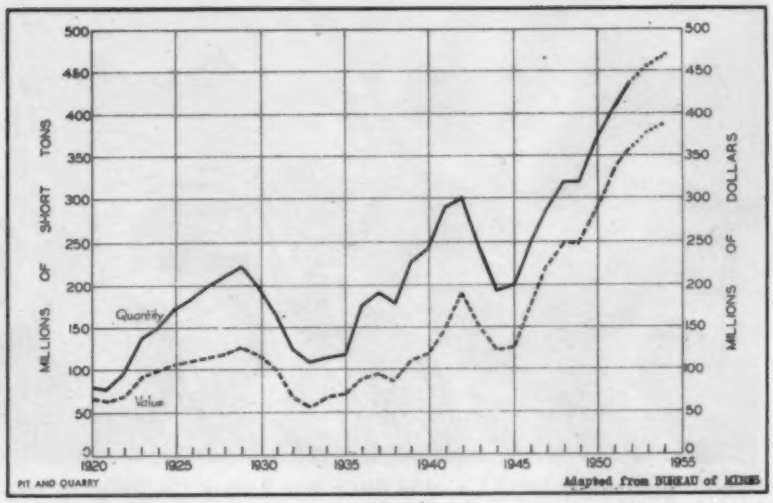
A production breakdown by states revealed California to be the leading producer, accounting for 12 percent of the output. Other leading states (in order to rank) were Michigan, Wisconsin, Ohio, New York, Minnesota, Illinois, and Texas, the eight states together comprising more than 50 percent of the total.

In 1952 commercial sales gained 6 percent over 1951, rising to 301,728,494 tons. Paving comprised 41 percent of the total, building 46 percent, railroad ballast 4 percent, and industrial uses 9 percent.

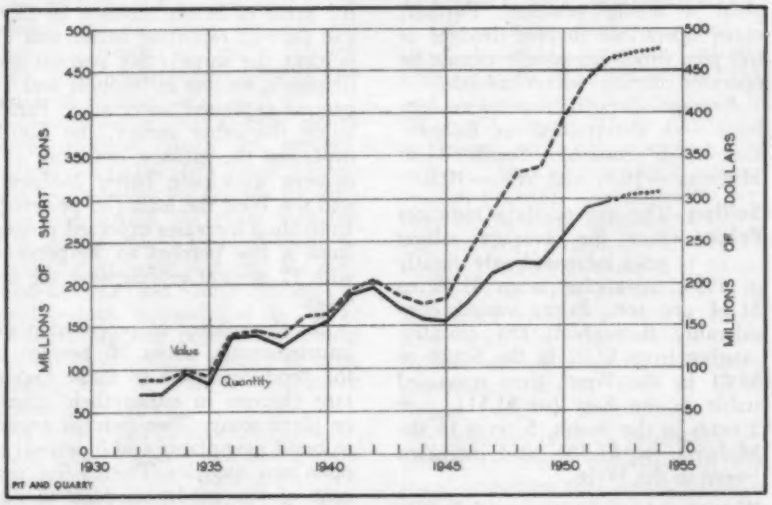
Washed, screened, and otherwise prepared sand and gravel comprised 90 percent of the total commercial output, selling for $1.02 per ton. The unprepared bank run material sold for $0.52 per ton.

In 1952 trucks moved 74 percent of the total sand and gravel output, compared with 70 percent in 1951; rail haulage dropped from 20 to 19 percent, whereas water haulage remained constant at 6 percent.

N.S.G.A. Survey Recently the National Sand and Gravel Association conducted its first survey of commercial sand and gravel production (for 1953), the results being published in September, 1954. The reporting companies (412) produced 162,457,463 tons, or about one-half of the total output. This report was reviewed earlier in PIT AND QUARRY (October, 1954, p. 22).



Production of sand and gravel in the United States, 1920-1954. (Includes both commercial and non-commercial operations.) Note: 1920-1952 data is adapted from a similar graph appearing in the latest Bureau of Mines "Minerals Yearbook", while 1953 and 1954 figures represent estimates made by Pit and Quarry based on our year-end questionnaire survey. The graph shows sand and gravel output to be at an all-time high.



Production of stone (including both crushed and broken stone and dimension stone) in the United States, 1932-1954. (Includes both commercial and non-commercial operations.) Note: 1932-1952 data is derived from past issues of the Bureau of Mines "Minerals Yearbook", while 1953 and 1954 figures represent estimates made by Pit and Quarry based on our year-end questionnaire survey.

CRUSHED STONE

A year ago we predicted in these pages that 1952 production approximated 298,000,000 tons (actually it was 298,797,340 tons) and that 1953 output dropped 2 percent to 292,000,000 tons. The survey data compiled this year, on the other hand, indicates that the latter prediction was too conservative, and that 1953 production probably topped the 1952 figure by several millions tons. The discrepancy is probably accounted for by a much better return this year, coupled with the fact that in 1953 producers underestimated their 1953 production (they received their questionnaires early in October and had to include an estimate for the last two months of the year).

The predicted rise to 310,000,000 tons in 1954 is accounted for by major gains reported in the East (10 percent) and South (6 percent), which more than offset the declines indicated for the Midwest (down 5 percent) and the West (down 3 percent). The significant decline in the Midwest in 1954 is accounted for largely by decreased agstone and metallurgical limestone output.

Comparing 1953 with 1952 on a geographical basis, a major gain was reported in the Midwest (about 6 percent), while the West remained the same and the East and South each gained about 1 percent.

Hourly Capacity The survey showed that from November, 1953, to November, 1954, the average hourly capacity per plant increased 11 percent (from 188 to 210 t.p.h.). Changes by sections were as follows: East—up 9 percent (from 263 to 286 t.p.h.); South—up 14 percent (from 172 to 197 t.p.h.); Midwest—up 8 percent (from 226 to 232 t.p.h.); and West—up 3 percent (from 226 t.p.h. to 232 t.p.h.).

The average plant operating time per year was 10.6 months, or nearly one month more than reported by sand and gravel. This difference is undoubtedly related to the fact that a much smaller percentage of stone producers wash their aggregate com-

General view of the new 500-t.p.h. plant of Glacier Sand & Gravel Co., Steilacoom, Wash., taken shortly before completion. A unique feature of the plant is seen in the serpentine storage structures directly below the classifying units.

pared to sand and gravel producers, and consequently do not have as great a winter problem. Further, many operations involve dredges or wet pits, which necessarily cannot be operated during winter months.

Average operating time on an area basis was determined as follows: East—10.6 months; South—11.6; Midwest —10.4; and West—10.6.

Selling Price The survey data indicates that the average selling price increased only slightly in 1954, advancing from $1.42 to $1.44 per ton. Prices varied considerably throughout the country, ranging from $1.21 in the South to $1.81 in the West; they remained stable in the East (at $1.51), rose 3 cents in the South, 5 cents in the Midwest (to $1.38), and increased 1 cent in the West.

Wages Important wage increases were noted, ranging from 5 cents per hour in the South to 20 cents in the West. The average hourly rate in November, 1954, was $1.49 or a gain of 7 cents (about 5 percent) during the year period. Changes by geographic sections were as follows: South—up 5 cents to $1.12; Midwest—up 6 cents to $1.50; East—up 7 cents to $1.45; and West—up 20 cents to $2.08. These changes corresponded closely with those reported in the other survey.

Personnel data revealed that the average number of employees per plant totaled 38. Averages by sections were as follows: East—59, South—49, West—30, and Midwest —30.

Outlook Crushed stone producers expressed about the same degree of optimism with regard to 1955 business as did the sand and gravel producers. Approximately 85 percent of those reporting predicted the same or better business in 1954 (38 percent reporting better and 47 percent the same). Six percent anticipate a decline in business and 11 percent expressed uncertainty. Paralleling the other survey, the South expressed the greatest optimism (43 percent anticipate better business) and the West the least (30 percent). Individual increases expected ranged from a few percent to 30 percent, with 12 percent representing the average.

On the subject of proposed plant improvements, about 56 percent of the producers plan to make important changes in either their quarry or plant setup. Two percent expect to build new plants and 8 percent to open new quarries. Twenty-five percent of the producers plan to add new quarry equipment, and another 18 percent expect to add stone plant equipment. About 35 percent plan to revamp their quarry and stone plants. Several producers expect to add portable plants in 1955.

1952 Statistics Production of crushed and broken stone in 1952, the year for which the latest accurate data is available, was 298,791,340 tons valued at $408,356,785*, representing a 5 percent tonnage increase and 8 percent value increase over 1951. Commercial production accounted for 91 percent of the 1952 output.

Major uses included concrete aggregate and road construction, 62 percent; metallurgical stone, 12 percent; railroad ballast, 8 percent; agstone, 7 percent; riprap, 3 percent; and alkali works, 2 percent. The first category showed a 10 percent gain in 1952, the second category, a 13 percent decline.

In addition to the commercial output, stone used for cement and lime production totaled about 80,450,000 tons, bringing the total crushed stone output to nearly 380,000,000 tons in 1952.

As in two previous years, limestone and dolomite constituted 72 percent of the crushed and broken stone output. Pennsylvania and Ohio continued as the two leading states in 1952, each producing 8 percent of the total. Other leading states in order of importance were Illinois, Michigan, New York, Missouri, California, Tennessee, and Iowa, these nine states accounting for 50 percent of the total output.

Methods of transportation in 1952 were truck, 54 percent; rail, 30 percent; waterway, 9 percent; and unspecified, 7 percent.

AGRICULTURAL LIMESTONE

Although statistics for agricultural limestone usage are not available for later than 1953, it appears that consumption of this major mineral in 1954 dropped at least 10 percent—perhaps as high as 25 percent—from 1953, thereby falling in between 15,000,000 and 18,000,000 tons. This figure represents only about one-half of the record output of slightly over 30,000,000 tons attained in 1947; it is also the lowest annual output since the early 1940's.

The decline in 1954 follows the even more drastic decline occurring in 1953, when the total use fell from 27,252,045 tons in 1952 to 20,599,890 tons—or a drop of 25 percent.

A combination of factors have accounted for the substantial decline in agstone consumption during the past few years. Of prime importance has been the "red tape" inherent in the Agricultural Conservation Program, coupled with additional restrictions imposed by individual states. It is apparent that states showing the biggest drop are those requiring farmers to have a soil test before being eligible to place limestone orders, whereas states allowing farmers to order minimum tonnages in lieu of soil tests are not declining as much. States having additional restrictions show still greater decline; for example, one state requires a farmer to buy 250 lb. of 0-20-20 fertilizer per acre before being eligible for agstone under the A.C.P. Another factor contributing to the decline has been the general reduction in farm net income, part of which has

*Note: This figure excludes dimension stone, whereas the production graph used in this article includes dimension stone.

been due to serious droughts, particularly in parts of the Midwest and South.

The outlook for 1955 is not too good, in spite of the fact that about 30 percent more A.C.P. funds will be available to farmers. The "fly in the ointment" is a new amendment which was passed during the closing hours of the last Congress; this restriction requires farmers to stay within their acreage allotments in order to be eligible for A.C.P. payments. This will not affect the farmers who generally stay within allotments in order to qualify for price supports, but will undoubtedly affect those growing such allotment crops as wheat and corn for home consumption (for livestock feed, etc.) and therefore do not stay within allotments. It is estimated that this new feature of the A.C.P. may keep as many as half the participating farmers out of the program. In view of this fact, it appears that 1955 agstone usage may show a further decline.

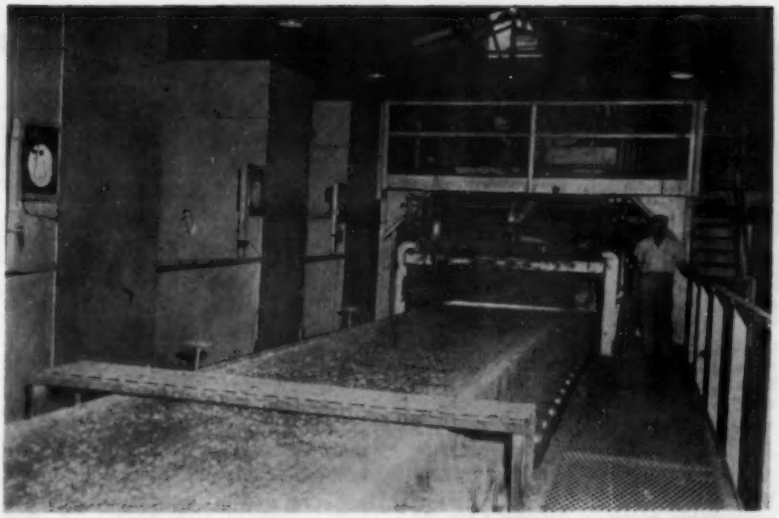
In 1953 Illinois again maintained its leading position among agstone consuming states, using 2,638,418 tons or 13 percent of the total. Missouri ranked second with 2,271,-135 tons (11 percent of the total), thereby displacing Iowa, which dropped to fifth place with its 1,846,-357 tons (9 percent). Other leading states in 1953 were Indiana (2,157,-864 tons or 10 percent), Ohio (2,-083,217 tons or 10 percent), Wisconsin (1,468,742 tons or 7 percent), Pennsylvania (1,073,566 tons or 5 percent), Virginia (734,639 tons or 4 percent), Kentucky (713,254 tons or 3 percent) and New York (703,-377 tons or 3 percent). These ten leading states consumed 75 percent of the total used in the United States. The same ten states led in 1952, although not in the same order.

All but six of the 42 states reporting showed declines in 1953; these six included Minnesota (9 percent gain), South Carolina, Nebraska, Delaware, North Dakota, and South Dakota.

Iowa showed the greatest tonnage decline in 1952 (over 1,300,000 tons or 42 percent), followed by Illinois (over 800,000 tons or 24 percent). Indiana, Missouri, and Ohio each had declines approximating 600,000 tons or about 20 percent.

SLAG

According to the latest Bureau of Mines report, output of commercial iron blast-furnace slag reached an all time high in 1953, totaling 30,-511,603 tons valued at $40,067,294 —or a gain of 13 percent in tonnage and 18 percent in value over 1952.



View of the 5- by 75-ft. traveling grate-type down-draft sintering machine, located in the recently built Moss Light Weight Aggregate Co. expanded clay plant in Memphis, Tenn. Several other new lightweight aggregate plants were built in the last year or two, making the industry one of the fastest growing in the U.S.

The substantial rise in output is explained by the heavy demand for slag as a mineral aggregate, coupled with an uninterrupted supply of raw material during the year.

Production in 1954 is expected to have declined about 10 percent, mainly due to the steel industry operating well below the normal production rate during the year; thus the raw slag supply was insufficient to meet the growing demand for slag products. Decided improvement in steel output is predicted in 1955; consequently slag production should rise in 1955, perhaps equally or even passing the 30 million ton mark achieved in 1953.

A breakdown of the 1953 government survey, which was based upon reports from 45 companies (68 plants processing air-cooled slag, 16 plants processing granulated slag, and 20 plants producing expanded slag), shows that in 1953 screened air-cooled slag comprised 79 percent of the output, unscreened air-cooled slag 3 percent, granulated slag 11 percent, and expanded slag 7 percent. Each of these products except unscreened air-cooled slag showed increases in 1953.

Major uses for air-cooled slag in 1953 were aggregate, 69 percent; railroad ballast, 21 percent; and mineral wool and roofing, each 2 percent. Major uses of granulated slag were manufacture of hydraulic cement, 42 per cent; road fill, 39 percent; and concrete block manufacture, 10 percent.

Slag is produced in 15 states, with Ohio, Pennsylvania, and Alabama accounting for 61 percent of the total output. Ohio continued as the leading producer in 1953.

LIGHTWEIGHT AGGREGATES

All available evidence points to the lightweight aggregate industry continuing its rapid growth in 1954, and that the boom will continue in 1955 and longer. These statements are based particularly upon our 1954 survey of the concrete block industry (which probably uses about 80 percent of the total lightweight aggregate output), coupled with reports received from the Bureau of Mines and various trade associations. The significant growth is closely correlated with the rapid strides made by the various concrete industries, particularly in the field of lightweight concrete construction.

The survey of block producers (reported in detail elsewhere in this issue) indicates that about 950,000,-000 lightweight (8-in.) units were produced in 1954, representing 50 percent of the total output. Assuming that one cu. yd. of lightweight aggregate yields 55* masonry units, it appears that the block industry alone consumed about 17,500,000 cu. yd. of material in 1954. To this amount must be added the vast volume of lightweight materials used in concrete construction, pre-cast concrete specialties, plastering and insulation, and countless other uses. No complete data is available for these other major uses, but it is estimated that they constitute an additional 5,000,000 to 10,000,000 yd.

The block survey mentioned above (comprising about 10 percent of the lightweight block output) revealed

*Actually the yield varies considerably with different materials. Representative yields are reported to be as follows: expanded clay or shale, 60 or over; cinders (coal or volcanic), 56; expanded slag, 60; and pumice, 45.

that 43 percent of reported lightweight production was cinder block; 27 percent, clay/shale; 17 percent, expanded slag; 7 percent, pumice; 4 percent, volcanic cinders; and 2 percent, others. However, on the basis of partial production data available, coupled with apparent discrepancies in the survey sample, it is estimated that consumption of lightweight materials by the block industry in 1954 is as follows:

Material	Estimated cu. yd.	Percent of Total
Cinders	8,500,000	49
Expanded slag	3,250,000	19
Expanded clay/shale	2,000,000	11
Pumice	2,000,000	11
Volcanic cinders	1,750,000	10
Total	17,500,000	100

The 1954 survey also revealed very interesting production data by geographic sections. In the East, 81 percent of the lightweight block were made with cinders, the balance by expanded slag and clay/shale. In the Midwest about 90 percent of the output was accounted for by these three materials, with slag leading (constituting 35 percent). In the South cinders constituted only 2 percent, with clay/shale comprising over 75 percent (slag was 15 percent). In the West the natural materials (pumice, scoria, etc.) dominated, accounting for nearly 50 percent of the total, with clay/shale running second (about 38 percent).

Indicative of the growth of lightweight production in 1954 compared to 1953 was the fact that 55 percent of the cinder block producers reported higher cinder block output in 1954, 82 percent of the slag block producers reported higher output, 75 percent of the clay/shale block producers reported higher output, and about 50 percent of the producers of volcanic lightweight blocks reported higher output. Prospects for 1955 were excellent, according to the survey, so another banner year is forecast for the lightweight aggregate industry.

Expanded Shale The Bureau of Mines canvassed the expanded shale/clay industry in 1953, and preliminary figures indicate that 1,110,000 tons of clay and shale were used for bloating. It is felt, however, that the figure was somewhat higher due to the fact that complete coverage was not obtained in the first canvass.

Based upon this initial survey and additional data, it is estimated that 1954 production approximated 2,250,000 cu. yd., which is probably a 20 to 25 percent increase over 1953. The growth is accounted for partly by several new plants (including both rotary kiln and sintering plants) beginning operation in 1954; this brings the total of plants in the United States and Canada to about 40.

A 10 to 15 percent increase in output is anticipated for 1955; additional new plant construction in 1955 will contribute to the steady growth of the industry.

Expanded Slag In 1953 (the year of latest accurate production data) expanded slag output reached an all time high of 2,285,758 tons, representing a gain of 16 percent over 1952 and 10 percent over the second highest year (1951); the 1953 output was valued at $5.5 million. Concrete block producers used 97 percent of the output; the balance went into concrete and other uses.

In line with reduced steel production in 1954, it is estimated that 1954 output of expanded slag will fall slightly below 2,000,000 tons.

Volcanic Aggregates In 1953, according to the Bureau of Mines, output of pumice and pumicite totaled 736,136 tons, valued at slightly over $2,000,000. This was a gain of 23 percent in tonnage over 1952.

Production of volcanic scoria and cinders totaled 612,000 tons in 1953, valued at $430,000. Because 1952 data of these materials are not available (they were combined with other types into a miscellaneous total), it is impossible to make comparisons.

In 1953 it was reported that 713,931 tons of pumice and pumicite, volcanic scoria, and cinders were used as concrete aggregate or admixture; the combined value was $1,600,000.

In 1952 pumice and pumicite production fell 20 percent to 597,044 tons, the decline being accounted for entirely by their use as a concrete aggregate and admixture. In 1952 concrete aggregates and admixtures consumed 93 percent of the output; abrasives, 4 percent; and acoustical plaster and other uses, 3 percent.

Production was reported from 14 states, with New Mexico leading (36 percent of the total), followed by California (22 percent), Idaho (5 percent), and Colorado.

Perlite According to estimates of the Perlite Institute, sales of expanded perlite were expected to reach the $10,000,000-mark for the first time in 1954, as the 9-year-old perlite industry continued to grow and set new production records. Sales were believed to approximate 208,000 short tons, or nearly 12,500,000 4-cu. ft. bags. This is an increase of about 15 percent over the 1953 sales of 174,461 tons reported by the Bureau of Mines.

The total sales of crude perlite rock were expected to be about 230,000 short tons with a value in excess of $1.7 million. In 1953, 198,751 short tons were sold or processed in the miner's own plants. The difference between the totals for crude perlite and expanded perlite represents material in stock, in transit, or sold to perlite processors outside the U. S. Also there is a small but growing market for the crude perlite in such products as fire retardant paints.

In 1954 about 20 firms were engaged in mining and marketing crude perlite from volcanic deposits in seven western states (about 80 percent from New Mexico and Nevada), while the number of perlite processing or "popping" plants has increased to 80 in 31 states.

In 1953 for the first time, the Bureau of Mines obtained data concerning the various uses for perlite. The breakdown was as follows: plaster aggregate (premixed and jobmixed), 141,000 tons or 81 percent; concrete aggregate, 18,000 tons or 10 percent; oil well muds and concretes, 7,500 tons or 4 percent; filter aid, 4,500 tons; and other uses, 4,000 tons. Thus about 90 percent of the output is used for lightweight, insulating plaster and concrete. Perlite producers anticipate considerable future growth in the field of insulating concrete, particularly for roof decks.

Vermiculite According to the latest Bureau of Mines report, production of vermiculite (screened and cleaned concentrates) in 1953 declined 9 percent from 1952, totalling 181,535 tons valued at $2,445,381. Output of expanded vermiculite also declined, dropping from an estimated 200,000 tons valued at $16,000,000 in 1952 to 185,000 tons valued at $13,000,000 in 1953, or a drop of 8 percent.

Major uses in 1953 continued to be loose fill insulation, plaster aggregate, concrete aggregate, acoustical plasters, and soil conditioning. No production data is available for each use, however.

Crude ore production is largely concentrated in Montana and South Carolina, with North Carolina and Wyoming providing lesser amounts. There are about 50 expanded vermiculite plants in the U.S., located in 37 states.

Nonmetallic Mineral Production Still Booming

By KENNETH A. GUTSCHICK

BASED upon reports of the U.S. Bureau of Mines, the output of domestic nonmetallic minerals other than cement and aggregates in 1953 (the year for which the latest complete statistical data are available) was greater than in any previous year. Several products reached all-time highs, and many showed minor gains over 1952; these gains more than offset the decreases shown by a few commodities.

The indication is that continued high output characterized the industry in 1954, with further new highs being established. However, tied to the reduced steel output in 1954, a few minerals like lime and fluorspar witnessed major declines.

Partial 1954 production data is available for a few minerals, including sulphur (10 months), fluorspar, lime, and bauxite (each for 9 months), and gypsum (6 months). In addition, estimates from authoritative sources have been made for several other minerals; the data appears in tabulated form on page 124.

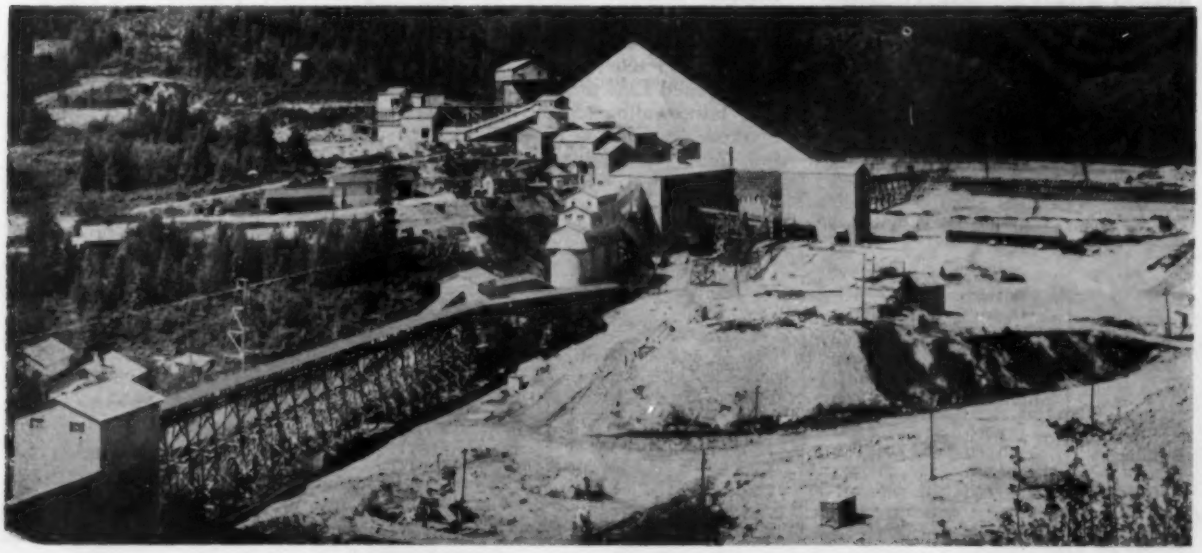
Based upon these partial 1954 production reports, it appears that sulphur output will reach an all-time high of 5,400,000 long tons, about 2 percent above the previous high in 1952. Bauxite production is expected to equal or better the 1951 peacetime high of 1,850,000 long tons, and gypsum output to exceed 1953 by 2 to 3 percent. No 1954 data is available for phosphate, but all evidence points to another all-time high being established; estimated production for 1954 is 13,000,000 tons. On the debit side, both lime and fluorspar productions are down considerably, due to slackening demand by the steel and chemical industries. Fluorspar output is estimated to be down 20 percent (to 245,000 tons) and lime (open-market) down 7 percent (to 7,500,000 tons).

Because 1954 data for other nonmetallic minerals is incomplete, it will be appropriate here to present a general picture of the nonmetallic minerals industries for 1953. Accordingly 1953 was a banner year for the fertilizer minerals (phosphate and potash), lime, and asbestos, as evidenced by the all-time tonnage highs attained in 1953; percentage gains were 10, 13, 20, and 1 percent respectively. In addition feldspar output gained 8 percent (not a record), although the value of product was the highest in history. Talc production was up 3 percent, making 1953 the second-best talc year. Other minerals showing gains in 1953 were kyanite (up 15 percent), magnesite (up 8), graphite (up 12), clay (up 2), kaolin (up 3), and fuller's earth (up 3).

On the other hand several of the industries discussed here showed slight decreases in 1953 production, including gypsum (down 2 percent), bauxite (down 5), sulphur (down 3), mica (down 3 but up 39 percent in value), bentonite (down 4 but value at all-time high), fire clay (down 9), and ball clay (down 1). However, in spite of the declines, the outputs were still at high levels. For example, sulphur output, although down 3 percent, still topped the 5,000,000 ton mark.

Lime Paralleling the major decline in steel output for 1954, lime production declined considerably in 1954 from the all-time high attained in 1953. Preliminary production fig-

A general view of the Northwest Magnesite Company's plant near Chewelah, Wash.; recently a heavy-media separation plant was added to upgrade the magnesite ore. The big pile which dwarfs the plant structures contains more than 1,000,000 tons of tailings.



ures released by the Bureau of Mines for the first 9 months of 1954 show commercial lime shipments totaling 5,520,484 tons or a drop of 14 percent from the corresponding period of 1953. The decline in the remaining three months was not expected to be as drastic; consequently open-market lime output for all of 1954 is expected to approximate 7,500,000 tons or a decline of 8 percent from the 8,114,000-ton record of 1953.

A breakdown of the 1954 data indicates that 74 percent of the 9-month total was quicklime, the remainder hydrated lime. Uses and percent of change from 1953 were as follows: chemical and other industrial, 57 percent of the total (down 12 percent); refractory dolomite, 23 percent (down 28 percent); building, 16 percent (up 3 percent); and agricultural, 4 percent (up 4).

Data for 1953 compiled by the Bureau of Mines indicates that a total of 9,674,000 tons of open-market lime and captive lime was produced. (8,114,000 tons represented open-market.*) The total output exceeded 1952 by 20 percent.

A breakdown of the various uses is presented in the table below. Note that chemical uses comprised 55 percent of the total commercial lime; refractory dolomite, 28 percent; building 13.5 percent; and agriculture, 4 percent.

Major chemical consumers of open-market quicklime were metallurgy, 36 percent; paper 20; water treatment, 17; calcium carbide, 16; glass works, 7; and sewage-trade wastes, 3.

In 1955 and years to come major increases in lime usage are expected in the fields of road stabilization (for road base construction) and abatement of stream polution. The latter is a growing problem which can be handled by greater use of lime for waste treatment. On the other hand there is a serious threat to the commercial lime industry offered by the sludge reclamation plants, which recalcine $CaCO_3$ formed during the water treatment process.

*This is the first year that the two classes of lime were separated.

Estimated 1954 Output of Selected Minerals

Commodity	Unit	1954 estimate
Abrasive stone:		
Abrasive quartz	Short Ton	250,000
Grindstones and pulpstones	"	5,000
Millstones	"	2
Grinding pebbles	"	3,000
Tube mill liners	"	1,200
Asbestos	"	53,800
Barite, crude	"	950,000
Boron minerals	"	750,000
Bromine	Pounds	175,000,000
Emery	Short Ton	10,000
Fluorspar (shipments)	"	245,000
Garnet (abrasive)	"	12,000
Gypsum, crude	"	8,400,000
Marl:		
Calcareous	"	270,000
Greensand	"	6,000
Perlite, crude	"	230,000
Potash	"	3,450,000
Pumice and pumicite	"	1,400,000
Pyrites	Long Ton	920,000
Salt, common	Short Ton	21,000,000
Sand and sandstone (ground)	"	800,000
Slate	"	710,000
Sodium carbonate, natural	"	425,000
Tripoli	"	40,000
Vermiculite	"	200,000

Gypsum Partial production data for gypsum for 1954 (first 6 months) shows domestic crude mine production totaling 3,910,591 tons, which is about the same for the corresponding period in 1953. Based upon greater gypsum activity for the second half of 1954, it is expected that the 1954 total will approximate 8,400,000 tons or a gain of 2 percent over 1953.

Among the gypsum products, larger percentage increases were shown during the 6 months of 1954 for sanded plaster (up 32 percent), roof deck plaster (up 22) and wallboard (up 6); declines were registered for agricultural gypsum (down 38 percent), base-coat plaster (down 4), and Keene's cement (down 14). Imports for the 6-month period were up 2 percent to nearly 1,400,000 tons, and calcined gypsum up 3 percent to 3,500,000 tons.

Estimated 1954 production of gypsum lath, wallboard and sheathing marks a new all-time high of 6.3 billion square feet. The previous record was 6.1 billion, which was reached both in 1951 and 1953.

Prospects for 1955 are excellent, based upon the $39.5 billion high in construction outlays predicted by the government in 1955. This good outlook is based in part on the 1954 housing legislation, high rates of savings and a plentiful supply of mortgage money with low down-payments and long payoff periods.

The spectacular growth of the home-improvement market is giving added momentum to the gypsum industry, since its major products are especially adapted for this market. Recent studies show that the flow of money and materials into home repairs and alterations is rapidly approaching the flow into entirely new home building.

Recent research activities of the gypsum industry have resulted in important new products and construction systems which are finding a steadily growing acceptance in the building field. They include a new "Type X" gypsum wallboard with extra-high fire resistance, ready-mixed lightweight plaster, and studless two-in.-soled gypsum lath and plaster partitions and improved lightweight fireproofing systems designed for commercial, apartment and institutional buildings. In addition the industry has completed several years of laboratory and field tests of a new grooved "stronghold" nail for the application of gypsum wallboard.

One outstanding development in the gypsum industry in 1954 was the developing of a new production area in southern Indiana; production by two major firms is expected to begin in 1955.

	Open Market Lime		Total Open Market Lime	Total Captive Lime	Grand Total Lime
	Quicklime (Short Tons)	Hydrated Lime (Short Tons)			
Agricultural	123,000	206,000	329,000	.....	329,000
Building	150,000	948,000	1,098,000	69,000	1,167,000
Chemical	3,700,000	717,000	4,423,000	1,460,000	5,883,000
Refractory	2,263,000	.....	2,263,000	32,000	2,295,000
Totals	6,236,000	1,871,000	8,113,000	1,561,000	9,674,000

In 1953, for which there is complete production data, crude domestic mined gypsum totalled 8,247,535 tons, a decline of 2 percent from 1952. The apparent supply amounted to about 11,500,000 tons, an increase of 4 percent over 1952. Imports approximated 3,200,000 tons or a gain of 4 percent.

Sulphur Preliminary figures for 1954 (first 10 months) indicate that native sulphur production in 1954 will reach an all-time record high of approximately 5,400,000 long tons, or about two percent above the previous high of 1952. Production through October, 1954, amounted to slightly over 4,500,000 tons or about 5 percent above the same period in 1953. Elemental sulphur production during the same 1954 period totaled 267,000 tons or a gain of 5 percent over the corresponding 1953 period. Shipments during the first 10 months, on the other hand, approximated 4,375,000 tons, which was down 1 percent.

Output of native sulphur in 1953 totaled 5,155,342 long tons, which was 3 percent below the 1952 all-time high; but the 337,000 tons of recovered sulphur (of a purity of 97 percent or greater) was 36 percent greater than the previous year. Mine or plant shipments, totaling 5,224,000 tons, were 0.2 percent above 1952.

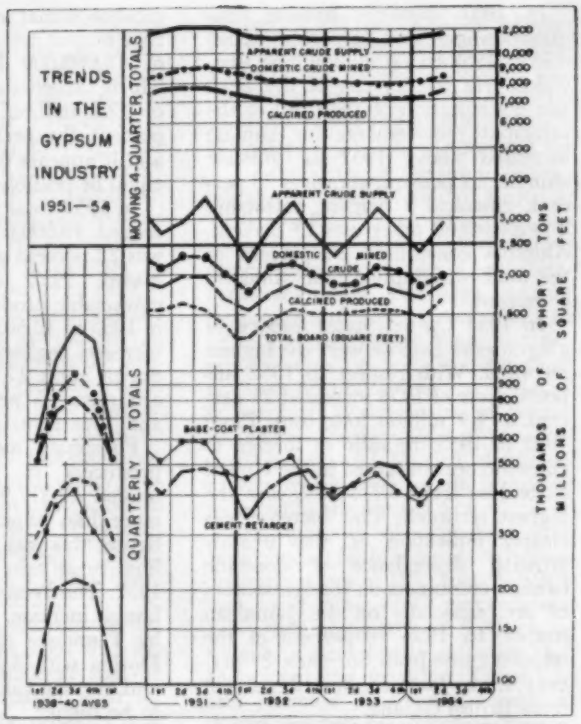
Fluorspar Paralleling the reduced activity in 1954 of fluorspar's chief consumer, namely the iron and steel industry, the 1954 output of fluorspar is expected to total about 245,000 tons, or a decline of more than 20 percent from the 322,891-tons attained in 1953. This is based on the production data available for the first 9 months of the year, during which time production amounted to only 182,358 tons or about 25 percent below the output registered in the same period of 1953. Shipments were also down considerably, totaling 179,651 tons, a decrease of 28 percent from the 9-month period in 1953.

In 1953 mine production declined 5 percent from the 345,000 tons reached in 1952. Shipments, totaling 317,930 tons in 1953, declined 4 percent, while imports reached an all-time high of 367,096 tons—a gain of 4 percent over the previous record of 1952. Consumption of flourspar likewise established a new record, attaining nearly 585,000 tons, or a 12 percent gain over 1952.

The steel industry in 1953 continued to be the leading consumer of fluorspar, absorbing 49 percent of the total consumption (this was a 5 percent decrease from 1952, however). Hydrofluoric acid used 38 percent of the total, or a gain of 25 percent over 1952.

In 1954 (first 3 quarters), steel usage fell to second place for the first time, being replaced by hydrofluoric acid; relative uses were 42 percent and 47 percent respectively.

Because of the declining demand for fluorspar in 1954, two Kentucky mines were closed during the spring of the year, and another mine (in Illinois) was partially flooded and mining operations reduced.

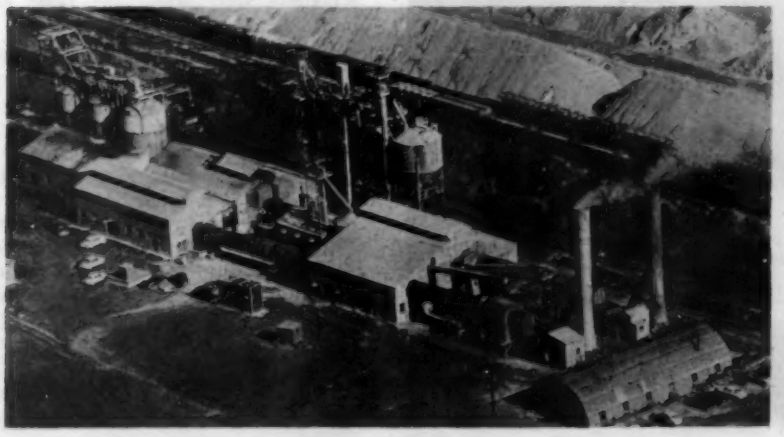


Bauxite Based upon preliminary data covering the first three quarters of 1954, it appears that domestic mine production of bauxite for the year will equal or perhaps top the peacetime record high output of 1,848,676 long tons (dried equivalent) reached in 1951; this will represent a 15 to 20 percent increase over 1953 production. This production is based upon the 9-month total of slightly over 1,400,000 long tons, which is 20 percent ahead of the output for the corresponding period in 1953.

Imports likewise headed for a record, totalling nearly 4,000,000 tons for the 3 quarters; the 1954 total should approximate 5,200,000 tons or about 20 percent above the 1953 peak. Total new supply is expected to reach the 7-million ton mark, representing a 17 percent gain over the record 1953 total.

In 1953, for which there is complete data, crude ore production (dried basis) totaled 1,579,739 long tons valued at about $13,500,000, representing a 5 percent decline in tonnage from 1952, but a 25 percent gain in value. This tonnage was 28 percent of the domestic consumption. Arkansas' production was 97 percent of the total, Alabama and Georgia contributing the remainder.

General view of Marblehead Lime Company's recently-built refractory dolomite plant at Thornton, Ill. The plant features a unique layout, wherein the raw materials are proportioned near the burner floor and fed to the kilns via long belt conveyors.



In 1953 domestic bauxite consumption increased 31 percent above that of 1952 to 5.6 million long tons, which was 93 percent of the peak war consumption of 1943. All of the principal requirements for bauxite increased above 1952 as follows: alumina 32 percent, abrasives 39 percent, chemical 7 percent, refractory 2 percent and other uses 23 percent. Alumina constituted 88 percent of the total consumption, and abrasives 6 percent.

In 1953 United States imports of all grades of bauxite were the highest recorded. With respect to 1952 imports, those of 1953 increased 28 percent to 4.4 million long tons. From 1952 to 1953 the ratio of foreign to domestic ore consumed in the United State rose from 1.7 to 2.7, also the highest recorded. This increase was clearly indicative of the steadily growing dependence of domestic bauxite consumers on foreign sources of ore, especially on the Jamaican supply. In 1953 70 percent of the imports came from Surinam, 27 percent from Jamaica and 2 percent from British Guiana.

The Bureau of Mines alumina demonstration plant at Laramie, Wyo., continued operations in 1953 and produced about 210 short tons of calcined alumina from anorthosite (a sodium aluminum silicate). When finally terminated, this project will have well-advanced a program begun by the United States Government during World War II for determining the feasibility of producing alumina during an emergency from materials other than bauxite.

Phosphate Although no 1954 production figures are available for the phosphate rock industry at the time of this writing (the Bureau of Mines semi-annual report has not been released yet), the indication is that marketable phosphate rock output reached an all-time high of 13,000,000 long tons in 1954, which exceeded the previous record of 12.5 million tons in 1953 by 4 percent. Prospects for 1955 are good, and it appears that 1955 output will equal or possibly exceed 1954.

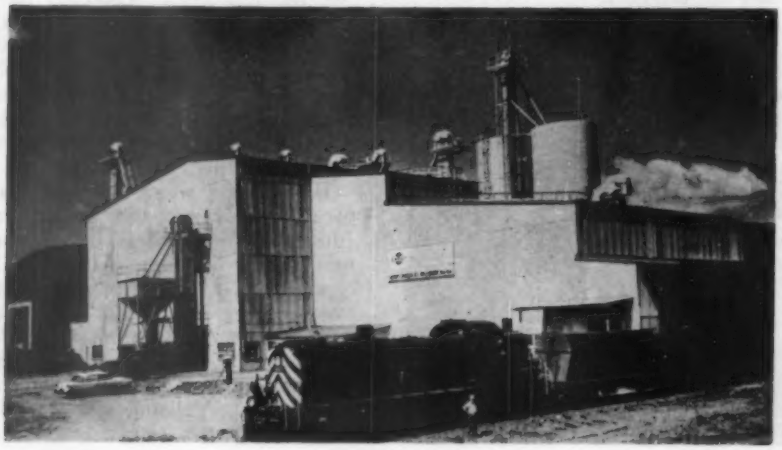
In 1953 total mine production exceeded 40,000,000 long tons, which was 22 percent greater than the estimated 1952 output. The total marketable production rose 4 percent in 1953 to 12,503,830 long tons, with increases registered in all three producing areas, 17 percent in the Western states, 5 percent in Tennessee, and 1 percent in Florida.

Phosphate rock sold or used by producers in the United States totaled 12,517,923 tons, which was more than 10 percent above the 1952 figure; this was valued at $76.6 million, or a gain of 12 percent over 1952. The Western states showed the largest increase, 59 percent, followed by Tennessee with 12 percent, and Florida with 4 percent. Total value and average value also were reported to be higher.

Imports, amounting to about 100,000 tons, were 8 percent below 1952, whereas exports, totaling slightly over 2,000,000 tons, were 47 percent above 1952. The apparent domestic consumption of 10,500,000 tons again set a new record, rising more than 5 percent above 1952 and more than 119 percent above 1943.

In 1953 Florida output comprised 73 percent of the total, Tennessee, 13 percent, and the Western states (Idaho, Utah, Montana, and Wyoming), 14 percent. Land pebble constituted 98 percent of Florida's output, the balance being classed as soft rock and hard rock. In 1954 it is estimated that Florida output approximated 9,500,000 tons, or a gain of 4 percent over 1953; Tennessee, 1,600,000 tons (same as 1953); Western states, 1,900,000 tons (up 10).

The new mill building of Cabot Carbon Co., Willsboro, N.Y., where various sizes of wollastonite, a new industrial mineral, are produced for the paint and ceramic industries.



Potash The domestic production of marketable potassium salts again reached a new high of 3,266,429 tons (1,911,891 tons K_2O equivalent) in 1953, increasing more than 13 percent above the 1952 production. Sales of potassium salts (totaling nearly 3,000,000 tons) and apparent consumption (totaling 3,100,000 tons) both increased in 1953, 8 percent and 4 percent, respectively, as compared to 1952.

Both imports and exports of potash materials were less in 1953. Imports totaled 253,000 tons (130,000 tons K_2O) compared with 357,000 tons (188,000 tons K_2O) in 1952. West Germany, East Germany, France, Spain, and Chile, respectively, supplied 34, 21, 29, 17, and 5 percent of the total United States imports.

The production of high-grade muriate (60-62 percent K_2O) rose 19 percent to 2,900,000 tons, and that of sulfate of potash (including sulfate of potash magnesia) increased 6 percent to 254,000 tons.

New Mexico, California, and Utah continued to supply the major portion of the domestic production, with New Mexico supplying 90 percent.

Asbestos Sales of asbestos produced in the United States advanced 1 percent beyond the all-time high of 1952, reaching 57,950 tons. Domestic sources, however, supplied only 7 percent of United States requirments, with Vermont being the principal producer. Arizona output was lower than in 1952, but the decline was confined to the shorter grades. Sales of the better grades increased moderately. Imports, amounting to 702,838 tons, and apparent consumption, totaling 754,218 tons, show little change from 1952. Imports of low-iron chrysotile of spinning grade from Southern Rhodesia were about the same as in 1952.

Asphalt In 1953 the Bureau of Mines improved its survey of the asphalt industry, first by showing a state breakdown of uses and second by reducing the items covered to three main groups, mainly, asphalt and asphaltic products sold for paving, roofing, and miscellaneous uses.

The reported sales in 1953 of 14,034,691 short tons of asphalt and asphaltic products are 12 percent above the 1952 total of 12,529,274; however, because of the changes in the setup of the 1953 survey the different items making up the totals for the two years are not comparable.

Sales of road oil in 1953 of 1,330,344 short tons were approximately 7 percent above the 1952 deliveries.

A breakdown of consumption showed that 65 percent of the output was used for paving, 25 percent for roofing, and 10 percent for miscellaneous. Under the paving category 52 percent represented asphalt cements (generally hot mix asphalt), 40 percent cut-back asphalts (asphalt cut by varying amounts of kerosene or naptha to vary the curing rate), and 8 percent emulsified asphalts. Leading states in the use of paving asphalt in 1953 were California (9 percent of the total consumption), Texas (8 percent), New York and Ohio (each 6 percent), Pennsylvania (5 percent), and Illinois (4 percent). Leading states (in order of importance) in use of asphalt cement were California, Texas and New York; of cut-back asphalt, Texas, Ohio, and Kansas; and of emulsified asphalt, California, Ohio and New York.

Sales of bituminous rock, as reported by producing companies, totaled 1,440,544 short tons in 1953 (valued at $4,349,000) compared with 1,570,698 in 1952 (valued at $4,688,000)—a decline of 8 percent. The limestone sold made up 92 percent of the total in 1953 and 91 percent in 1952. The balance was sandstone. Limestone was produced in Alabama, Oklahoma and Texas, while the sandstone was credited in the report to Missouri, Kentucky and Oklahoma.

Producers sold 60,505 short tons of gilsonite, valued at $2,184,000 in 1953 and 60,740 tons, valued at $1,780,000 in 1952. All the gilsonite was mined in Utah.

Feldspar Production of crude feldspar in 1953, totaling 452,600 long tons, increased 8 percent in quantity and 24 percent in value over 1952. The value of the 1953 crude production (approximately $4,600,000) was the highest in the history of the industry, exceeding the previous high value of 1952 by 24 percent, although the quantity produced in 1953 was only the fourth highest production on record. The average value per ton has increased progressively since 1946. Ten states reported production in 1953, the same number as in 1952.

In 1952, North Carolina was the only state to report an increase in crude feldspar output over the previous year; in 1953, Colorado, North Carolina, and South Dakota reported increases over 1952. North Carolina continued to be the largest producer, with 59 percent of the quantity produced (57 percent in 1952). South Dakota was second with 11 percent of the total (10 percent in 1952), and Colorado was third with 10 percent (9 percent in 1952).

The glass, pottery, and enamel industries in 1953 consumed 97 percent of the ground feldspar sold by merchant mills compared with 99 percent in each of the previous four years. In 1953, glass accounted for 55 percent and pottery, 39 percent.

The tonnage and value of aplite produced increased 9 percent and 10 percent, respectively, in 1953 over 1952. There are only two producers of aplite in the U. S., from mines in Amherst County, Virginia, near Piney River.

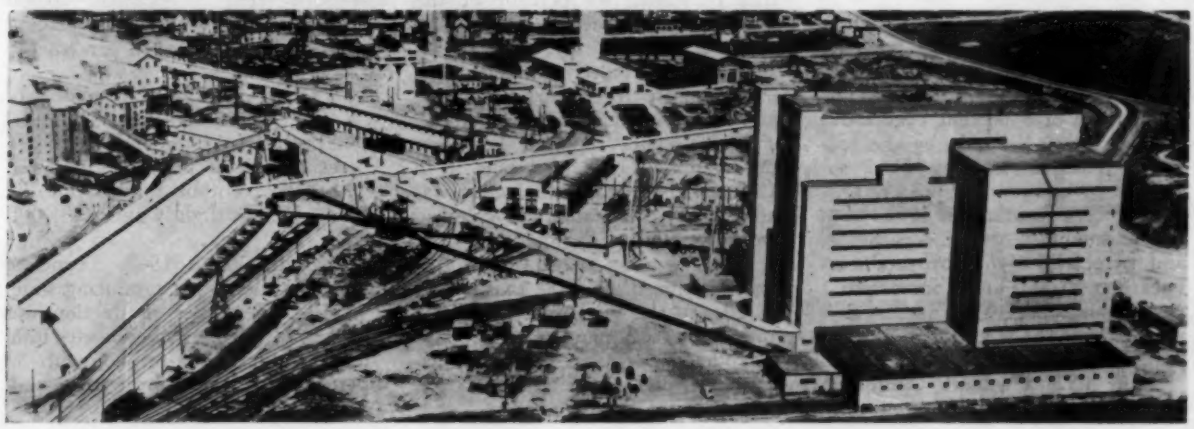
Kyanite Domestic kyanite production showed increases of about 15 percent in crude and about 10 percent in refined material in 1953 compared with 1952. Sales of domestic kyanite increased about 10 percent in quantity and 15 percent in value for the same period. Since there were only two producers, Commercialores, Inc., from deposits near Clover, S. C., and Kyanite Mining Corp., from a property near Farmville, Prince Edward County, Va., the Bureau of Mines is not at liberty to publish mine production statistics.

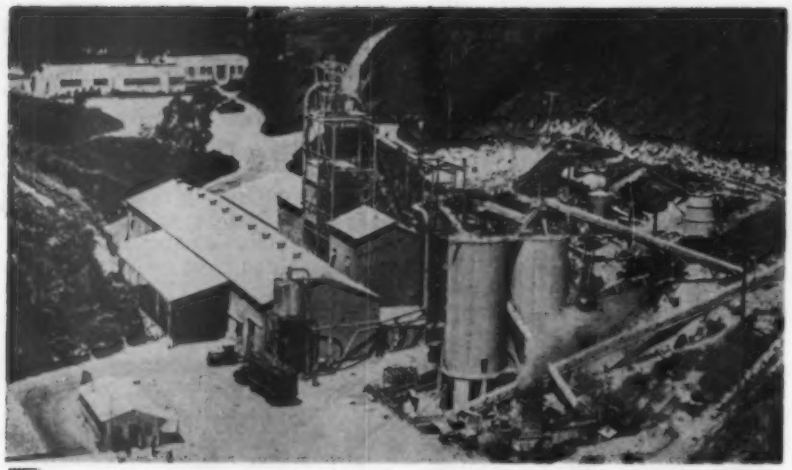
Graphite The strong demand for natural graphite following the outbreak of war in Korea in 1950 resulted in an abnormal increase in the number of operating mines throughout world graphite-producing areas. The large increase in production from these mines in 1952 and 1953 more than met the requirements of both industry and government purchasing; consequently, surpluses of some types of graphite existed during 1953. Madagascar, Ceylon, and Mexico continued to supply the bulk of the graphite required in the United States.

The quantity of crystalline and amorphous graphite produced from domestic mines in 1953 totaled 6,281 tons, an increase of 12 percent over 1952; but shipments of 4,850 tons were 5 percent less in quantity and 18 percent less in value. These figures reflected the general condition of the market for graphite in the United States during the past two years and indicated that increasing availability of foreign graphite would continue to reduce the consumption of domestic graphite.

Magnesite Crude magnesite production in the United States in 1953 totaled 553,147 tons valued at about $3,200,000, or an increase of 8 percent in quantity and 12 percent in value, compared with 1952. However, the 1953 figures were 17 percent less in quantity and 28 percent less in value than the record year 1951. Quantity sales of caustic-calcined magnesia, refractory magnesia, and dead-burned dolomite increased 13, 3, and 19 percent compared with 1952 figures.

Aerial view of the Johns-Manville asbestos plant at Asbestos, Que., Canada. The mill (on the right), which began partial production during the fall of 1954, is said to be the world's largest and most modern. Other mining and milling facilities are shown in the background. At left is the 60,000-ton capacity dry rock storage building.





The plant of the Great Lakes Carbon Corporation's Dicalite Division at Walteria, Calif. Here the company is processing diatomite trucked in from a 165-acre deposit recently opened up about 3 miles away.

Mica The quantity of domestic mica sold or used in the United States during 1953 decreased about 3 percent in quantity and increased 39 percent in value compared with 1952. Output in 1953 was 73,684 tons, valued at nearly $4,000,000. This was the second-largest year tonnage-wise since 1880. Quantity sales of scrap and flake mica decreased about 2,000 tons, but sales of sheet mica, mainly as a result of expanded government buying, increased to 850,000 lb. or 22 percent gain in weight and 137 percent in value. Consumption remained at a high level, but total imports of mica decreased 16 percent.

Supply of domestic mica in 1953 was the largest for the mica industry since 1946. North Carolina maintained its rank as the largest producing state for sheet mica in 1953, by supplying 73 percent of total domestic output. The remainder was reported from the following states arranged in order of importance by weight sold or used: New Hampshire, Connecticut, Idaho, Virginia, Georgia, South Dakota, Maine, and Alabama.

Talc Combined mine production of talc, soapstone, and pyrophyllite in the United States in 1953 amounted to 621,506 tons, or an increase of 3 percent over 1952, and was exceeded only by the record high production of 1951. Pyrophyllite production was 123,457 tons or 2 percent less than in 1952.

The quantity of talc, soapstone, and pyrophyllite sold by producers (nearly 600,000 tons) increased 1 percent, but the value decreased 1 percent from the record high of $11,347,317 set in 1952.

As in 1952, New York, California, North Carolina and Vermont were leading producers in 1953, accounting for 25, 20, 19, and 13 percent, respectively, of the total output. North Carolina continued as the major pyrophyllite producing state, followed by California. Production of sericite schist, a material with properties and uses similar to those of pyrophyllite, was reported from Pennsylvania.

Clay Clay production totaled 42,435,964 tons in 1953, an increase of 2 percent over 1952. Two-thirds of this output was accounted for by miscellaneous (primarily structural clay) and slip clay (for cement manufacturers); other types were fireclay and stoneware clay (24 percent), kaolin (4 percent), bentonite (3 percent), and ball clay and fuller's earth (1 percent each).

Bentonite The production of bentonite in 1953 was exceeded only by the banner year of 1952; tonnage decreased 4 percent to 1,269,971 tons but the value increased 9 percent to slightly over $16,000,000, thus setting a record.

The foundry and petroleum industries consumed 93 percent of the total tonnage, with rotary-drilling mud accounting for 46 percent (583,373 tons); filtering and decoloring oils, 20 percent (251,107 tons); and foundry-sand bond, 27 percent.

Eleven states reported bentonite production in 1953, the same as in 1952. One new state (Alabama) was added, and Montana was dropped from the list.

The Wyoming-South Dakota district produced 876,000 tons or 69 percent of the total output in 1953 (Wyoming, 52 percent and South Dakota, 16 percent). Mississippi accounted for 15 percent, and Texas 4 percent in 1953.

Fire Clay Fire clay sold or used in the United States decreased 9 percent to 10,267,113 tons in 1953 compared with 1952 (11,285,173 tons). This was the third-largest fire clay production in the history of the industry, being exceeded only by the 1952 and 1951 (record year) figures. A slackening in the consumption of refractories in the steel and other industries (except construction) that started in 1952 continued through 1953.

In 1953, Ohio ranked first in fire clay output, followed by Pennsylvania, Missouri, West Virginia, Indiana, California, Colorado, Texas, Kentucky, Arkansas, and Illinois. These 11 states accounted for 92 percent of the total production in 1953.

Kaolin The domestic production of kaolin or china clay in 1953 increased to 1,883,974 tons, or a gain of 3 percent above 1952. The upward trend in kaolin production that began in 1945 was broken only in 1952.

Nine states produced kaolin in 1953, compared with 10 in 1952. No production was reported from Illinois in 1953. Georgia, the principal producing state, continued to hold first place in 1953, with 71 percent of the total United States output. South Carolina was second with 17 percent (18 percent in 1952).

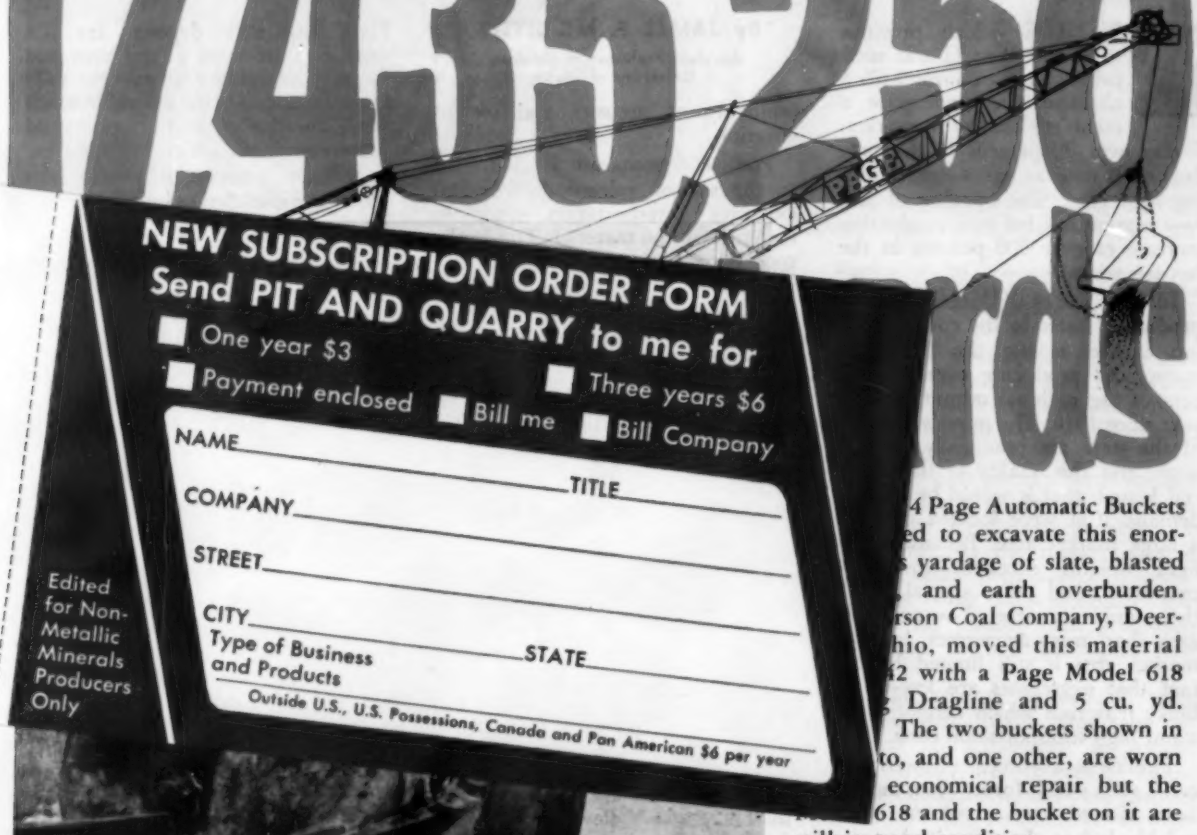
Fuller's Earth Production of fuller's earth increased 3 percent in 1953 compared with 1952, totaling 435,837 tons valued at $7,600,000. All reporting districts showed an increase in tonnage in 1953 compared with 1952. The Florida-Georgia area accounted for 62 percent of the total tonnage, and Texas 24 percent.

Fuller's earth consumed in mineral-oil refining in 1953 totaled 92,000 tons or 21 percent of the total output; absorbent uses, 130,000 tons or 30 percent; insecticides, 76,000 tons or 17 percent; rotary-drilling mud, 52,000 tons or 12 percent.

Ball Clay In 1953 ball clay production showed a 1 percent decrease in tonnage and a 14 percent decrease in value compared with 1952; output totaled 300,762 tons valued at slightly under $3,400,000.

Beginning with 1943, Tennessee has been the largest producing state. In 1953 Tennessee production was 55 percent of the United States total and Kentucky was second, with 33 percent. Next in line were Maryland, Mississippi, and California.

17,435,250 rds



4 Page Automatic Buckets ed to excavate this enor- yardage of slate, blasted and earth overburden. rson Coal Company, Deer- hio, moved this material 42 with a Page Model 618 Dragline and 5 cu. yd. The two buckets shown in to, and one other, are worn economical repair but the 618 and the bucket on it are still in good condition.

"That's what we call good service," says Mr. Clyde Peterson, "so when we needed more coal than the 618 could uncover, we bought the Model 721 Page Walker shown in the picture. With a 7 cu. yd. bucket and 125 foot boom it's just what we wanted. Fast, economical, and easy to operate; and the new Page horizontal V-6 Diesel engine has plenty of power for even the heaviest load."

Page Automatic Buckets are noted for their digging ability. Write for bulletin GPB454 for details.

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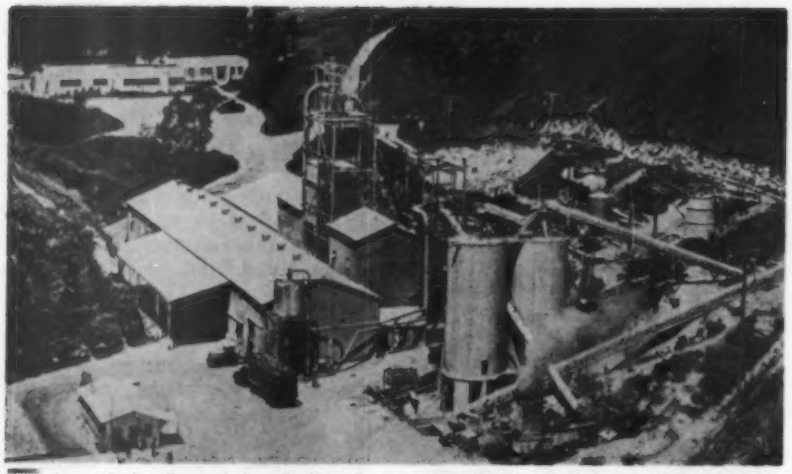
AUTOMATIC DRAGLINE BUCKETS
DIESEL & ELECTRIC WALKING DRAGLINES



The plant of the Great Lakes Carbon Corporation's Dicalite Division at Walteria, Calif. Here the company is processing diatomite trucked in from a 165-acre deposit recently opened up

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As in 1952, New York, California, North Carolina and Vermont were

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Only 4 Page Automatic Buckets needed to excavate this enormous yardage of slate, blasted rock, and earth overburden. The Peterson Coal Company, Deerfield, Ohio, moved this material since 1942 with a Page Model 618 Walking Dragline and 5 cu. yd. buckets. The two buckets shown in the photo, and one other, are worn beyond economical repair but the Model 618 and the bucket on it are still in good condition.

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AUTOMATIC DRAGLINE BUCKETS
DIESEL & ELECTRIC WALKING DRAGLINES

Pumice Development In Idaho

By JAMES F. MC DIVITT
Assistant Professor of Geology
University of Idaho

another P&Q exclusive

PUMICE, which previous to World War II was used principally as a natural silica abrasive, has undergone a complete change in market. Today over 90 percent of the production is used as lightweight building aggregate. The opening of this new market has led to a production increase of over 800 percent in the last ten years.

Idaho is one of the largest pumice-producing states in the country, being ranked among the first four states, and producing over 10 percent of the national output in each year since 1946. The pumice reserves of the state are practically without limit, and the quality of the material is such that it would be in high demand if it were located close to a large market area. Because of its light weight, excellent insulating properties, and other special qualities, pumice is marketed over a wider area than most aggregates, but the market area is still limited by the fact that aggregates are low-value, bulky materials which cannot withstand high transportation costs.

Pumice is a porous, siliceous volcanic glass which forms when molten lava, ejected from a volcano, cools quickly before the contained steam and gases can escape. The bubbles caused by such gases make the resulting rock very light and frothy, so that it may float on water in spite of its specific gravity of about 2.5. Acid, or rhyolitic lavas, are more apt to give rise to pumice formation than basic lavas, since their greater viscosity is more likely to plug the volcanic vent, with the resulting build up of pressure and violent eruption.

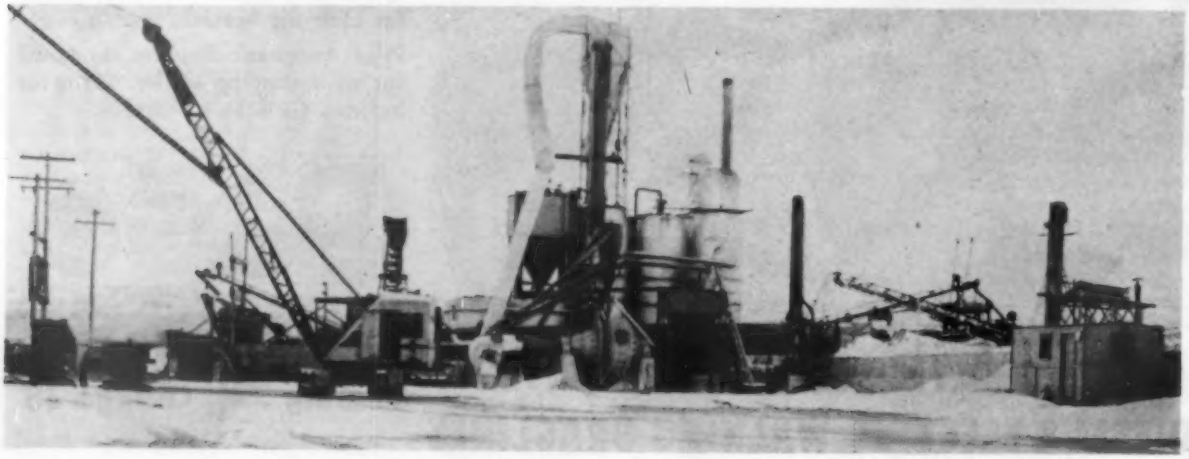
Pumice deposits are formed close to the site of volcanic activity, as extensive transportation tends to break down the material. The frothy rock is concentrated to some extent by air classification during settling, and further by wind action on the ground. Good deposits may develop when pumice falls on or is carried to a body of water, where it floats, becomes water-logged, and settles as a sedimentary deposit. Because of the susceptibility to physical breakdown, most pumice deposits are of relatively recent geological age (Tertiary or Quarternary). Since most of the recent volcanic activity on this continent has been in the West, our main pumice deposits are in the Western states.

The volcanic activity in southern Idaho from the Tertiary to the present has led to the development of pumice in many parts of the state, in association with rhyolitic flows which underly the more recent basalt. Deposits are known to exist in the Magic Valley Reservoir area in Blaine County, on the Fort Hall Indian Reservation north of Pocatello, and in the Idaho Falls area. No doubt, other deposits are known, as conditions were present for pumice formation throughout much of the area bordering the Snake River Plain, but such deposits are not worthy of attention at this time due to poor accessibility. Pumiceous tuffs are recorded as being extensive south of Twin Falls; and consolidated pumiceous tuffs, which might be expected to accompany pumice deposits, are quarried as building stones in some of the communities south of Twin Falls, and in the Lava Hot Springs area.

State production to the present has come mainly from pits a few miles southeast of Idaho Falls, where the hills which border the Snake River Plain are underlain by large tonnages of pumice. This material is a well-sorted water-laid pumice, overlying welded rhyolitic tuff where the base is exposed, and capped in places by a thin layer of welded tuff. Trenching of the hills east of the plain near Ammon has shown that in almost every case where the cap is not present, pumice underlies the thin soil which has developed. The reserves opened up by such trenching are sufficiently large so that there has been no need to look beneath thick soil or cap rock for additional deposits.

Cuts show the pumice to be at least 75 ft. thick in the mining area, and mining is carried on by cutting into the face of the deposit with power shovels and bulldozers. Overburden increases into the hills; and when it becomes too thick to strip economically, mining operations are moved to a new face.

The major pumice producers in the state are The Clark Concrete Construction Corporation and Pumice Incorporated, both of Idaho



The new pumice processing plant of Pumice, Incorporated, at Ammon siding, near Idaho Falls. The plant is equipped to produce natural pozzolan.

Truck-loading operation at the Pumice Incorporated pit. Note the stratification of the pumice deposit (background).

Because of the unconsolidated nature of some pumice deposits, bulldozers can be used in these mining operations.

Falls. The Sunite Sales and Manufacturing Company is developing the Magic Valley Reservoir deposits, south of the Sun Valley area.

Clark Concrete Construction Corp. This is an integrated operation, which mines pumice from its own pits for use in its block plant. A bulldozer handles all the mining, pushing pumice from the face of the pit directly into the truck, which is in a loading slot below the pit floor. Due to the extremely light weight of pumice, one 30-ton semi-trailer dump truck can haul 40 cu. yd. per load, and is able to keep the block plant supplied. About 30,000 tons of pumice a year are trucked the 9 miles from the mine to the block plant, during the hauling season of nine to ten months.

Clark markets its blocks entirely by truck, and finds that it can serve its area adequately and cheaply by this method. Use of trucks limits the area of the market; but it is possible to ship the higher-value blocks by truck, whereas it might not be economical to ship raw pumice. The main market is in southeastern Idaho and the adjacent parts of Montana, Wyoming, and Utah.

Pumice Incorporated Some 50,000 tons of pumice a year are produced by this firm* for the open market. The pumice is mined on benches by bulldozers and shovels which cut into the vertical walls of the pit. Shovels are used to load the pumice into high-board dump trucks with capacities ranging from 18 to 25 cu. yd. or in 30-cu. yd. semi-trailers.

Raw material is trucked to a rail siding less than 5 miles from the mine. Here a new $250,000 plant has been constructed for drying, crushing, sizing, blending, and bagging aggregates. The product is loaded on rail cars, each holding an average of 50 tons, and shipped to markets in Idaho and adjacent states. The largest market area is in northern Utah. Within the last few years some shipments have been made to North Dakota, Minnesota, and Michigan, and attempts are being made to expand markets in these areas. Although the cost of pumice may be increased several times by transportation charges, its desirable features give it a market, and Idaho is the closest large source for a wide area.

Sunite Sales and Manufacturing Company This concern has deposits near the Magic Valley Reservoir about 10 miles southwest of Bellevue, and some 30 miles south of Sun Valley. Bellevue is on the Wood River branch of the Union Pacific. The company is reported to have the contract to build 350 dwelling units in the new atomic city at Moab, Utah, and officials plans to use pumice in this construction.

From this description of Idaho operations it will be seen that future expansion is limited by the nature of the market which they serve. The market for aggregates is large, but the share which pumice supplies is relatively small; some 720,170 tons of pumice were used in building in 1951 as opposed to over 134,000,000 tons of sand and gravel. Most of the market for pumice exists in the area of the deposits. Thus over 90 percent of Idaho pumice production is marketed within Idaho, Utah, Wyoming, and Montana.

If this past pattern were applied to the future, production, although significant locally, could never be very large, as the market area is one of small population. However, steps are being taken to broaden the market for pumice both geographically and through developing new uses.

In an attempt to broaden their market area, Idaho producers requested an adjustment in freight rates from the Interstate Commerce Commission, and were granted lower rates into certain Midwest markets, effective August 1, 1953. After this reduction into specific areas by the ICC the railroad voluntarily adjusted other rates to bring them into line. The new rate has reduced the cost of shipping carloads lots of pumice from Idaho Falls to Chicago from $12 per ton to $7.50. Since mine-run pumice is valued at $2 per ton at the mine, it will be seen that even the new transportation charges are significant, and will undoubtedly help in broadening the area which can be economically served from the Idaho deposits.

The market for pumice in the highly populated areas of the East is very remote; and it can be served

(Continued on page 135)

Pumice and Pumicite Production in the United States*

	1944	1945	1946	1947	1948	1949	1950	1951	1952
California	31,409	75,238	89,181	169,037	196,934	149,878	157,497	264,413	129,780
Idaho	.....	.....	108,847	98,618	79,426	71,373	93,990	83,528	88,085
New Mexico	.....	.....	62,623	85,639	177,630	351,368	351,642	245,564	217,482
Oregon	.....	.....	3,004	33,240	106,277	104,475	79,653	47,026	59,578
Kansas	43,034	47,484	35,466	.....	.....	.....	.....	.....	.....
Total (including states not listed)	88,757	157,011	319,883	442,552	607,746	716,742	719,356	749,942	597,044

*Source: U.S. Bureau of Mines Reports

*See Utley, Harry F., *Idaho Firm Adds Processing Plant to Natural Pozzolan*, PIT AND QUARRY, November, 1954, page 76.

KOEHRING COMPANY Milwaukee 16, Wis. Subsidiaries: JOHNSON PARSONS • KWIK-MIX

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Check Koehring lift ratings shown below — then ask your Koehring distributor to give you the figures on price per pound of lifting capacity.

Compare for yourself:

KOEHRING MODEL	SIZE DIPPER	KOEHRING LIFT CAPACITIES (Crawler ratings based on 75% of tipping load. Rubber-tired machines — 85% of tipping load)		PRICE PER POUND OF LIFT CAP.*
205 CRAWLER	½-Yd.	20,000 lbs.	30-foot boom at 10-ft. radius	?
205 ON RUBBER	½-Yd.	30,000 lbs.	25-foot boom at 12-ft. radius	?
304 CRAWLER	¾-Yd.	27,800 lbs.	35-foot boom at 12-ft. radius	?
304 ON RUBBER	¾-Yd.	50,000 lbs.	30-foot boom at 10-ft. radius	?
405 CRAWLER	1-Yd.	40,000 lbs.	40-foot boom at 12-ft. radius	?
605 CRAWLER	1½-Yds.	72,300 lbs.	50-foot boom at 12-ft. radius	?
1005 CRAWLER	2½-Yds.	159,000 lbs.	50-foot boom at 12-ft. radius	?

**Figures available on request—ask your Koehring distributor to see them.*

BIG-PRODUCTION TEAM — Loading rock, Koehring 1½-yard shovel (above) is teamed up with Koehring Dumpsters.©

K451

Second Annual Meeting Of Slag Plant Operators A Successful Affair

K. K. Kagarise, Standard Slag Company, Youngstown, Ohio, who very capably served as chairman of the operators meeting.

another ON THE SPOT report

THE recently-formed Plant Operator group of the National Slag Association held its second annual meeting at the Netherland Plaza Hotel, Cincinnati, Ohio, on Thursday and Friday, December 2 and 3. Judging from the record attendance and stimulating discussions, the two-day affair was highly sucecssful. K. K. Kagarise, Standard Slag Company, Youngstown, Ohio, was chairman of the meeting.

A major highlight of the meeting was an inspection trip on Friday to two modern slag plants owned by the American Materials Corporation, which are located at Middletown and Hamilton, Ohio. Most of the day was spent at Middletown, where the group saw the new 125-t.p.h. expanded slag (Amlite) plant. This operation, which was described recently in PIT AND QUARRY*, obtains its raw slag from the largest blast furnace in the world—that is, Armco's plant at Middletown. The Hamilton plant, on the other hand, is a hard slag operation.

Another highlight was the presentation of PIT AND QUARRY trophies to the 1953 winners of the N.S.A. sponsored slag plant safety contest. Ken Gutschick, field editor, PIT AND QUARRY, made the presentations at the annual luncheon.

The Fairfield plant of the Birmingham Slag Company, Fairfield, Ala., was awarded the Class A trophy (for plants operated 60,000 or more man-hours) for its outstanding record of 116,365 man-hours without a lost-time injury. Charles W. Ireland, Birmingham's president, received the bronze trophy, as well as individual certificates of accomplishment in safety for each employee of the Fairfield plant. This is the second time in the 5-year contest history that the Fairfield plant has won top honors, the other year being 1951.

The Class B trophy (for plants operated less than 60,000 man-hours) was awarded to the Donora plant of the Cambria Slag Company, Donora, Pa.; accepting the award, as well as individual safety certificates for plant personnel, was Harold Turner, Cambria's president. The Donora plant, which also won top honors in 1950, was operated 58,921 man-hours without a lost-time injury during the 1953 contest period.

Additional injury-free plants during 1953 were honored at the luncheon by being presented with Bureau of Mines Certificates of Accomplishment in Safety; presentation of these awards was made by E. W. Bauman, N.S.A. managing director. Besides the two trophy winners, 21 other plants received the certificate awards. That this is a meritorious performance on the part of slag industry is indicated by the fact that these 23 plants represent slightly more than one-half of the total number entered in the contest.

The luncheon group was addressed by Seth T. Reese, chief, Accident Analysis Branch, Health and Safety Division, Bureau of Mines, who congratulated the slag members for their outstanding 1953 safety record. In his talk Mr. Reese outlined ten factors of safety which should be integral parts of a comprehensive safety program. These include self preservation, personal material gain, loyalty, responsibility towards oneself and others, pride in one's work, rivalry, conformity to safety rules, leadership on the part of management, logic, and humanity. Of prime importance, he stated, is that individuals have faith in themselves, in their fellow man, and in God.

During the operators round table meeting on Thursday, a number of important items were discussed. Among the subjects covered were conveyors, rubber belting, dipper teeth, electrical equipment, plant maintenance, labor relations, job classification, automation, dust problems, and locomotives. In addition, problems concerning lightweight aggregate production were discussed in conjunction with the plant tour on Friday. Several other items were scheduled for discussion, but because of the intense interest shown in the problems considered and because of lack of time, discussion of these items had to be postponed until the next meeting.

In the discussion of belt conveyors,

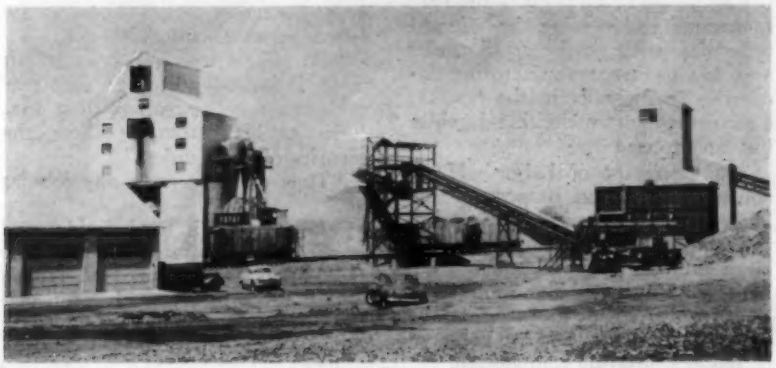
*See Trauffer, Walter E., *Lightweight Slag Aggregate*, December, 1954, PIT AND QUARRY, pp. 73-75.

Seth T. Reese, Bureau of Mines safety expert (center) posing with Charles W. Ireland, Birmingham Slag Company (left) and Harold Turner, Cambria Slag Company. Mr. Ireland and Mr. Turner are holding the 1953 Pit and Quarry safety trophies, which were won by Birmingham's Fairfield, Ala., plant (Class A competition) and Cambria's Donora, Pa., plant (Class B competition), respectively.

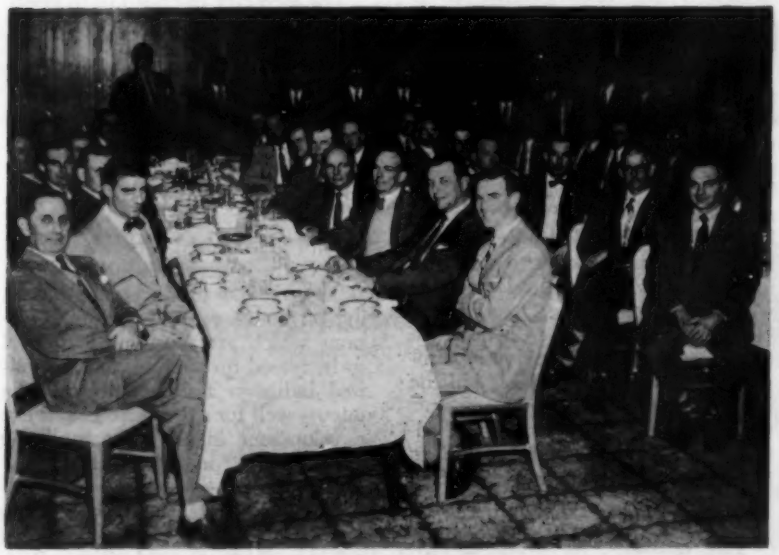
two producers mentioned the use of high-angle idlers (35 and 45 degrees), pointing out such major advantages as greater capacity, elimination of skirt boards, and less spillage. Pros and cons of belt splicing, belt patching, and vulcanization were also considered. One producer reported the successful use of replaceable cast caps for dipper teeth.

On the subject of repair and maintenance, one producer reported from his experience that it was better to work two shifts and repair with a small crew on the third shift than to work three shifts and repair on week-ends. Another producer discussed his company's maintenance program. He stated that the company has a central maintenance group made up of salaried workers whose entire job is preventive maintenance. Inspections are made monthly of all company plants, and items in need of repair are listed. During the interval between inspections, the superintendent of each plant must take care of the faulty items. It was reported that this program, in use over two years, has been very successful; in fact, maintenance costs were substantially reduced during the second year (by about 30 percent). The same company keeps detailed records of delays, carefully analyzing them in order to determine how to reduce them to the minimum.

Also under discussion were methods of cooling slag, methods of pouring from ladles to the pit (layer loading *vs.* progressive pouring), and the hydrogen sulphide problem. Concerning the latter problem, mention was made of the successful use of chlorine chemicals to counteract the odor at the slag pits. On the subject of the dust problem, various types of collectors were considered. The use of diesel-electric locomotives around slag pits was also considered; one major problem brought up was crankcase dilution.



A general view of the new expanded-slag plant of American Materials Corporation at Middletown, Ohio, which was toured by the slag plant operators group.



A luncheon scene, showing the record turnout of plant operators. Highlight of the luncheon was the presentation of safety trophies and certificates.

Pumice Development

(From page 131)

by foreign producers who ship by sea. West Coast markets are served by deposits in California, Oregon, and New Mexico. Thus any expansion of market area must be into the Midwest, for which Idaho is the best large source of supply. New pumice products such as colored split brick and block are being produced and marketed in this area, and can command a premium price which covers the high shipping costs.

Further steps are being taken to improve the position of the industry. The Clark Concrete Construction Corp., with a primary interest in the pumice block market, is lowering unit production costs, and improving its product through installing high-pressure curing equipment which cuts down on the curing time (each hour of high-pressure curing equals three to four days of atmospheric steam curing and yard curing combined) and minimizes drying shrinkage. As a further marketing aid, the company has erected a new office building at the plant in which the various pumice products are used and attractively displayed.

Pumice Incorporated, with much broader market interests, has developed a series of products ranging from traction granules to give cars traction on icy roads, to soil conditioners and various types of aggregates. Much hope is held for the market for pozzolan, which is defined by A.S.T.M. as a "siliceous or aluminous material which in itself possesses little or no cementitious value, but will in finely divided form, and in the presence of moisture, chemically react with calcium hydroxide at ordinary temperatures to form compounds possessing cementitious properties." The company's new plant is equipped to produce pozzolan from pumice.

Pozzolan is used extensively in dam construction, since it adds strength and cuts down on permeability under high water pressures. The Palisades Dam on the Snake River east of Idaho Falls is obtaining its pozzolan from the blast furnace slags of the Chicago area, on which transportation charges are $14 to $20 per ton. A similar pozzolan produced at Idaho Falls could be provided at the dam site for less than this transportation cost. With the continuing dam building program in the West, a market for pozzolan appears assured; and as the special properties of the material

(Continued on page 136)

Report on Current Labor Developments

By S. HERBERT UNTERBERGER
S. Herbert Unterberger and Company
Industrial and Labor Economists
Washington, D. C. — Philadelphia, Pa.

Cost of Living Stability

another P&Q exclusive

FOR THE most recent two-year period for which data is available — November, 1952, through October, 1954 —the cost of living has been remarkably stable. As the following figures show, during those two years the cost of living index was never lower than 113.4 and never higher than 115.4, a total variation of 2 points or only 0.75 percent of the average level.

B. L. S. Consumers Price Index (1947-49=100)

Nov., 1952	114.3	Nov., 1953	115.0
Dec.	114.1	Dec.	114.9
Jan., 1953	113.9	Jan., 1954	115.2
Feb.	113.4	Feb.	115.0
Mar.	113.6	Mar.	114.8
April	113.7	April	114.6
May	114.0	May	115.0
June	114.5	June	115.1
July	114.7	July	115.2
Aug.	115.0	Aug.	115.0
Sept.	115.2	Sept.	114.7
Oct.	115.4	Oct.	114.5

In the last year the cost-of-living index was never lower than 114.5 or higher than 115.2 a total variation of .7 points or only 0.6 percent of the average level.

The last period of cost-of-living stability of similar length is found around 1937 to 1939, just before the nation finally came out of the great depression of the 1930's. The previous period of cost-of-living stability of comparable length was around 1927 to 1929, just before the economic collapse of 1929 which started that depression.

This raises the ominous possibility that a lengthy period of cost-of-living stability precedes the turning point of the business cycle. If there were no other forces at work, this would suggest that a downturn in economic activity is imminent. Fortunately, of course, there are other forces, such as government fiscal policy and the activities of the Federal Reserve Board, which are administered to provide anti-depression measures.

Nevertheless, such extreme stability in the cost-of-living index may not necessarily be the healthiest sign.

Minimum Wage Developments

The Republican Secretary of Labor, James P. Mitchell, is beginning to sound very much like the long line of Democratic secretaries who he succeeded. It appears as though he is going to try to get the new Congress to pass a law raising the present 75 cents per hour minimum wage to 85 cents an hour. He also wants to extend wage and hour protection which includes not only the minimum wage but also the requirement for time and one-half for all hours worked in excess of 40 per week to several million retail and service industry workers who are now exempt.

These plans are certain to be opposed by a multiplicity of forces both within and outside the Administration. The principal opposition within the Administration will come from Sinclair Weeks who, in discharging his responsibility as Secretary of Commerce, has become the traditional enemy of proposals originating in the Labor Department. He will be joined by a variety of industry spokesmen representing the affected industries, such as the retail trades and low-paying manufacturing industries (principally in the South), e.g., textiles, cotton clothing, lumbering, and tobacco.

The Secretary of Labor will, of course, receive the support of the labor movement and the covert but probably not public support of a large number of businessmen from both the North and the South, who are already paying in excess of the proposed minimum and are bothered by low-wage-paying competition.

The chances are still good that the Mitchell proposals will never receive Administration endorsement. Even if they do, the backing will probably be luke-warm.

Nor will the proposals have easy sailing, even in a Democratically-controlled Congress. For political reasons, Southern Democrats will probably have to oppose any increase in minimum wages. Even if there are enough votes from the combined liberal Democratic and Republican forces to pass the measure, it still may not pass because the Democrats will be tempted to try to raise the minimum wage figure to a dollar, a figure which they previously proposed. This would probably kill the measure. However, the Democrats might regard that as a political advantage, since it would become an issue to take to the voters in 1956.

Other Labor Department Proposals

On other matters, as well, the Republican Secretary of Labor has picked up the torch laid down by his predecessors.

He has frequently stated his support for amendments to state unemployment compensation laws which would raise benefits and extend their duration. He has called for improved (liberalized) Workmen's Compensation laws; and he has said that state action is warranted on disability laws protecting workers against the cost of sickness incurred off the job.

What is likely really to raise a "hornet's nest" is his statement to the CIO convention opposing state laws which bar the "union shop". These are euphemistically called "right to work" laws. They make it illegal for employers or unions to enforce labor contracts making union membership a condition of employment.

As his reasons for opposing these laws, Secretary Mitchell made the following statements:

"Actually, these are laws which make it impossible for an employer to bargain collectively with a majority of his employees about the security of their union."

"They do not create any jobs at all."

"The result is undesirable and unnecessary limitations upon the freedom of working men and women and their employers to bargain collectively and agree upon conditions of work."

"They restrict union security and thereby undermine the basic strength of labor organizations."

The secretary did not fail to inject a political angle into his statements. He noted that 12 of the 17 states which had these "undesirable" laws were in the South, presumably dominated by Democrats.

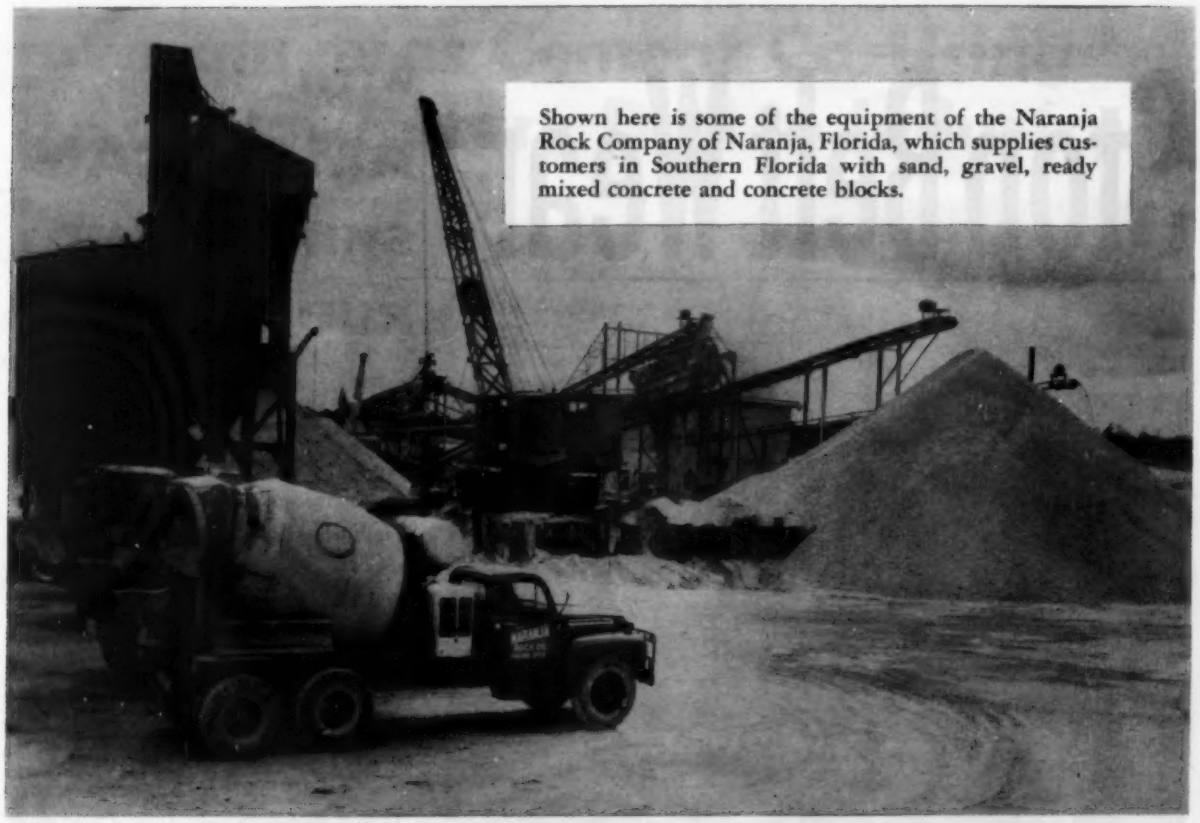
Pumice Development

(From page 135)

become recognized, its use should spread into other fields.

Thus Idaho producers are carrying on active research in the directions which are most likely to lead to increased production and a stabilized industry. This healthy attitude augurs well for the future of pumice development in the state, and the firms engaged in this development.

THEODORE R. ARMSTRONG has been appointed Philadelphia District sales manager for the Giant Portland Cement Company.



Shown here is some of the equipment of the Naranja Rock Company of Naranja, Florida, which supplies customers in Southern Florida with sand, gravel, ready mixed concrete and concrete blocks.

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Home-made skirtboards of old belting can cost you many months of conveyor belt life. Here's why: fabric in old belting is stiff; also picks up moisture. The moist edge collects sand and grit, starts grinding the life out of your belt.

You can end this damage now by installing AMERICAN skirtboard rubbers. They're smooth and pliable, won't pick up moisture or sand. They're flexible so you can set them closer to the belt to keep material from working under and stop spillage without danger of belt damage. They're tough — last with little attention, save you the hours you're spending now to maintain and replace home-made skirtboards.

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Calaveras Cement Co. Using Largest Rotary Drill in Industry

IN February, 1954, the Calaveras Cement Company placed in service at its No. 4 Quarry near San Andreas, Calif., the largest rotary drill ever to be used in the cement industry.

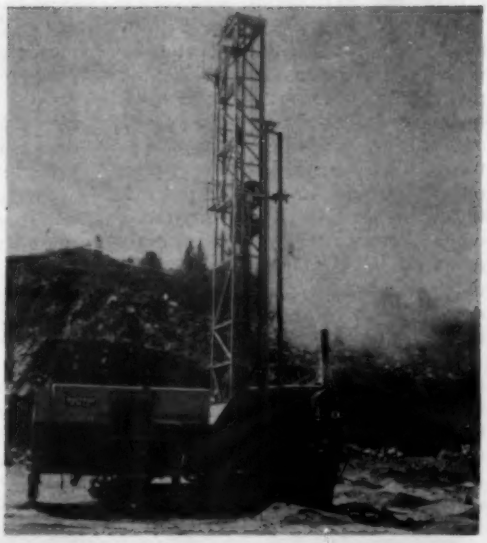
This unit, a Bucyrus-Erie 50-R machine, takes full advantage of large-hole drilling techniques. (It can drill a 12½-in.-diameter hole, but Calaveras so far has utilized only a 9⅞-in. bit.) Previously, the use of such huge drills had been confined to a few coal and iron-ore mines in the East, but the California concern has now demonstrated the speed and economy of such equipment in stone quarrying. When the San Andreas operation was visited in the summer of 1954, company officials were expressing general satisfaction with the results obtained to that time, and were freely predicting that their $115,000 investment in the big drill will have been repaid in full before the end of the first year through direct savings in drilling and blasting costs alone.

By HARRY F. UTLEY

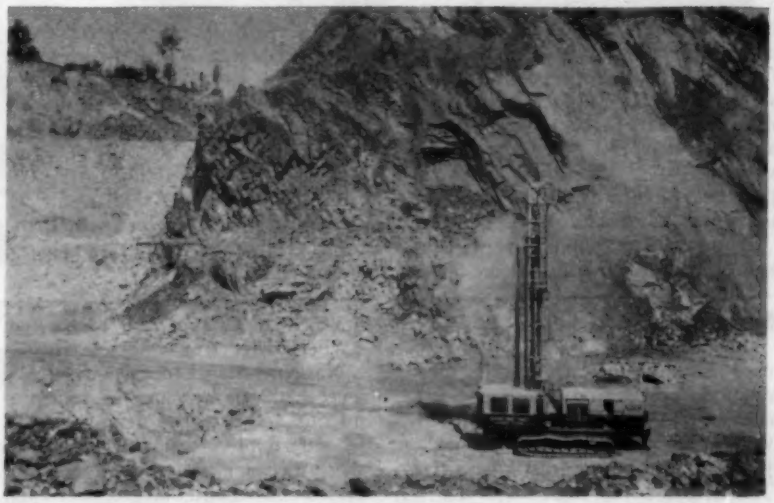
During the last 9 or 10 years Calaveras has trebled its plant capacity. As raw-material demand increased, the company began seeking speedier and more efficient drilling methods. The initial step along these lines was taken three years ago when the company acquired its first rotary rig to supplant the churn-drills which were formerly used. This unit was equipped with a 7⅜-in. bit, the maximum size which could be used with the machine. Costs were reduced so remarkably that it was decided to acquire the 50-R machine to reap the full benefits of the greater speed, larger hole, and other anticipated economies.

The No. 4 Quarry is the present source of most of the limestone used. It is located 6 miles from the plant. The stone taken here makes up about 80 percent of the raw-material needs of the four-kiln plant. Actually, the stone is a friable marble

Right: This rotary rig, installed last year in the quarry of the Calaveras Cement Company at San Andreas, Calif., is the largest drill of its type in use in the cement industry. It is electrically operated and can drill holes up to 12½ in. in diameter.



Below: This quarry view shows how the high face is now being benched. The drill and the hole pattern may also be seen.



Below: The 5-cu. yd. shovel loading one of the 30-ton delivery units which carry the material to the plant 6 miles away.

of high-calcium, low-magnesia content and tilts about 55 degrees from the horizontal in the formation. Since the quarry was first opened up in 1938, a 160-ft. high face has been developed, but the deposit is now being benched downward on approximately 50-ft. levels.

With the big drill, the 9⅞-in. holes are spaced on 21-ft. centers in multiple rows and sunk to depths ranging from 40 to 55 ft. Schists, quartzite, and cherts are encountered as intrusions, and these dikes of extremely hard material were tough on the bits and slowed up drilling—until Hughes R-1 tricone bits faced with tungsten carbide were adopted as standard. Footage now averages about 165 ft. per shift, with 2-shift operation. A 40-hole shot is detonated about once a week.

Cooling of the bit and removal of the cuttings as drilling progresses is accomplished by compressed air, two 640-c.f.m. compressors mounted on the drill supplying the air. The heavies pile up adjacent to the holes for use as stemming material, and the fines are picked up and handled by a Rotoclone collector, also an integral part of the drill. The machine can drill continuously for about 33 ft. before an additional drill-pipe section need be added. Ward-Leonard electric control permits drilling at the most efficient speed as deposit variables are encountered. Down pressure is hydraulically powered for maximum controlled penetration.

The experience of Calaveras with rotary drills in general and the large, new unit in particular, was the subject of an interesting technical paper, prepared and delivered at the recent American Mining Congress in San Francisco by Lewis A. Parsons, the company's consulting engineer. He brought out two salient points which seem to contribute to the faster payout of the 50-R, under conditions as they occur at San Andreas:

"(1) The larger the bit, the greater the footage per bit, and per shift. We have checked with other operators on this point, and their experience has been the same. We are not entirely clear as to the reason, but it seems to be a basic fact that must be taken into consideration in planning any drilling program with rotary drills. One theory is that the larger bit has more room for bearings, stronger teeth, more 'beef' in general. My own opinion is that, in addition, possibly the larger area gives a more even bearing on the bit, and that the teeth are less subject to uneven wear from local hard spots.

"(2) The 9⅞-in. hole breaks 35 tons per foot of hole, compared to 18 tons for the closer-spaced 7⅞-in. holes. Fragmentation is not a problem with us, and in our ground there is no increase in secondary breaking with the larger hole. We are thus able to space our 9⅞-in. holes on 21-ft. centers, compared to 15 ft. for the 7⅞-in. holes. This results in a marked reduction in the cost per ton broken, which is the final result we are all after, and toward which the cost per foot of hole is merely an intermediate step.

"We have checked powder consumption per ton to see if there is any difference in our rotary holes, compared to our churn-drill holes; but so far no difference has been evident. Other operators have reported a smaller consumption for the rotary hole, caused presumably by a smoother hole and the tendency of air-blown chips to seal crevices, but we have not yet observed that in our work. Our consumption remains at 0.8 lb. or slightly less per yard for limestone, and 0.7 lb. for the silicates, equivalent to 0.33 lb. per ton. We use Hercules Gelamite 1 on the bottom and Hercomite X on top, about half and half, stemmed with cuttings from the rotary drill. Primacord is used for fuse, fired from a 440-volt line."

Only the minimum of secondary shooting is required, much of such additional breakage being accomplished through the use of a Ni-Hard 5,000-lb. dropball. Side-dump, 2-compartment diesel semi-trailers haul 30-ton loads over a company-built road to the primary crushing station at the plant. Loading is done by Bucyrus-Erie electric shovels, the largest a 120B unit swinging a 5-cu. yd. bucket.

Improvements at the plant which are being carried out this year include the installation of Muticlone collectors to extract clinker dust from the exhausts of the Fuller coolers, and the streamlining of packhouse operation and loading methods. Grant W. Metzger is superintendent of the San Andreas plant.

National Slag

(*From page 59*)

used primarily in concrete block production, comprising about 75 percent of the total sales. Other lightweight uses include precast slabs, joists, and other precast specialties. The density of the lightweight aggregate varies from 40 lb. per cu. ft. for the coarse to 50 lb. for the fine.

The two coarse hard slag products are used primarily in the local manufacture of mineral wool. Intermediate and finer sizes are used as both concrete and bituminous aggregates. Roofing also accounts for some of the ½- to ⅛-in. sales. Main uses for screening include concrete block, concrete sand, and fill. The weight of the hard slag aggregate varies from 2,000 lb. per cu. yd. for the coarse to 2,400 lb. for screenings.

Deliveries are made by both rail and truck. A single rail track serves both the lightweight bins as well as the two hard slag truck hoppers. Loading trucks from stockpiles is handled by a Baker-Lull 1½-cu. yd. 4-wheel drive front-end loader.

National Slag Ltd. plans to make several major changes in the production setup in the near future. A second Kinney-Osborne expanded-slag processing unit is expected to be added at a second blast furnace early in 1955. In the hard slag plant a surge pile and reclaiming tunnel between the primary crusher and Screening Station A will be added shortly. This will provide a more uniform production schedule. A secondary crushing station will also be added to increase the production of fines. The present plant has been laid out in order to accommodate these two changes.

Officers and directors of National Slag Ltd. are Harris N. Snyder, president; G. G. Robinson, vice-president; and Donald E. Steele, acting secretary and treasurer. Other directors are G. S. Snyder, James Mogan, Ross G. L. Harstone, and Donald H. Henderson. R. D. Margesson is sales manager, William England, superintendent, and W. F. Pierce, plant engineer.

The entire plant, including the conveyors and radial stackers, was designed and built by the company under the direction of G. S. Snyder and W. F. Pierce. Link Belt and Stephens-Adamson idlers and pulleys and Dodge Torque-arm reducers were used in the extension conveyor system. General Electric Co. supplied the electric motors, and Westinghouse Co. the switchgear. All crushing and screening stations are enclosed with corrugated asbestos sheathing for year-round operation.

C. K. Hobson, vice-president of Certain-teed Products Corporation, recently announced that his firm had acquired approximately 74 percent of the outstanding capital stock of William Cameron & Company of Waco, Tex. The latter concern manufactures sash and doors and handles building materials.

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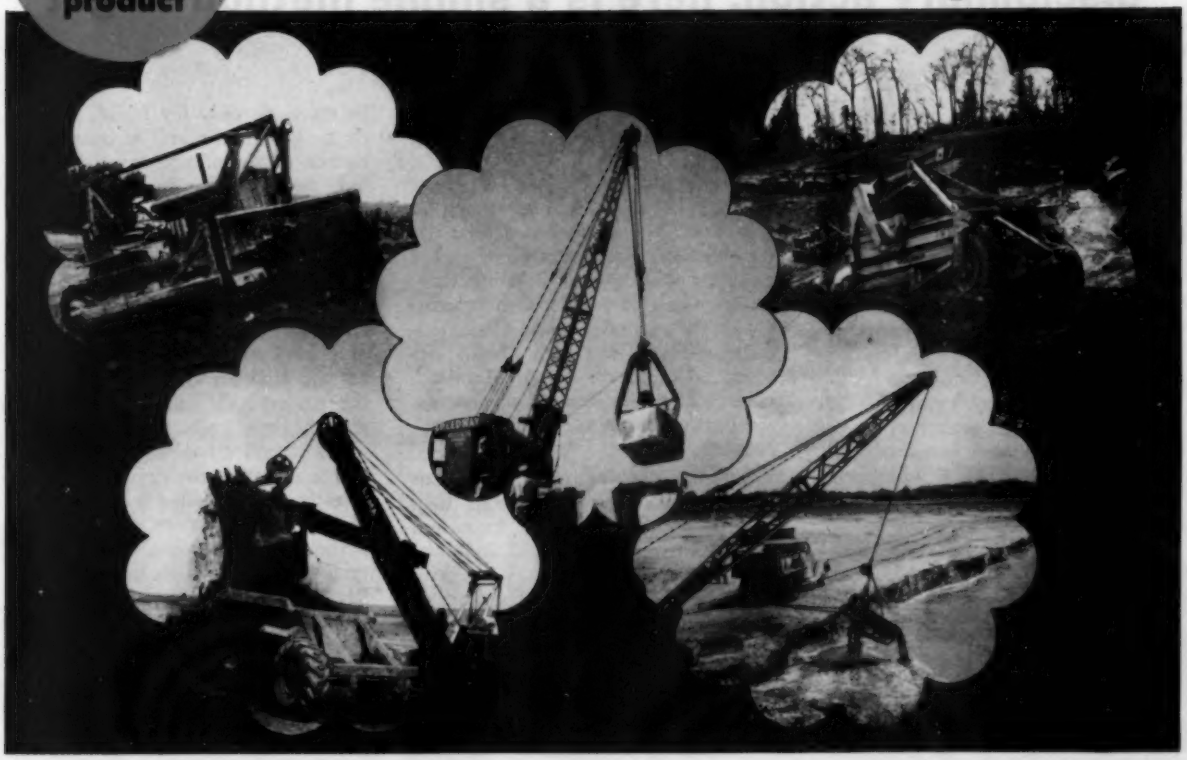

If you operate any of these machines, this information may save you money on your wire rope purchases...

• Every machine you use wire rope on has characteristics which must be considered in choosing the rope which will give you the longest service. For instance, the bulldozer and carrier scraper have extremely small sheaves which bend the rope sharply and small drums which cause very severe abrasive and crushing actions on the rope. So the best rope is "Streamlined" Flattened-Strand.

Regular crane service is usually not too hard on rope but sometimes the sheaves are rather small and there is a great deal of whipping and frequently twisting to contend with.

Shovels have big sheaves but are subjected to shock loads and jerks which can yank a rope in two. Draglines also offer a real challenge. Usually they have smaller sheaves. The rope drags in the dirt and it gets one bad shock after another.

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How To Solve Labor Disputes

Whether your dispute is over a wage increase, or disciplinary action, here is a simple method to get it settled quickly

By ROBLEY D. STEVENS
Management Consultant

IN the day-to-day operations of the producer and manufacturer of cement, crushed stone, gypsum, lime, sand, gravel, and other nonmetallic minerals, involving hundreds of workers, labor disputes are bound to arise. They may affect labor-management relations, the application or interpretation of the terms of a collective-bargaining contract, or they may deal with the assignment of jobs, transfers and promotions, wages and hours, disciplinary action, and other matters.

Because of the possible wide range of potential misunderstandings, management should set up some sort of machinery for adjusting grievances to insure smooth, uninterrupted operation.

The use of arbitration is effective, because it has variable functions, and is informal and flexible. Arbitration is a substitute for possible economic action—the strike. Labor disputes in many cases arise out of the negotiation of a collective-bargaining agreement or out of the interpretation and application thereof.

Today, about 42 states have some kind of facilities, established by law or practice, for the settling of labor disputes.

Under the Taft-Hartley Law (Labor-Management Relations Act, 1947) there is a provision for handling labor disputes under the supervision of the Federal Mediation and Conciliation Service. Because the use of arbitration is a practical method to adjust labor disputes, it should not be overlooked by management, which sooner or later may be faced with labor disputes. These can cost time, worry, and money, unless they are promptly settled.

What is arbitration? The experts say that arbitration is an orderly process whereby management and labor attempts to solve misunderstandings based upon the merits of the case. The arbitrator appointed endeavors to arrive at a settlement. He considers the evidence presented and upon arriving at a just conclusion makes an award.

Frances Keller in her excellent book, *Arbitration in Action,* says in part that: "Arbitration is a final determination of the respective claims or rights of the parties in controversy on the basis of proofs. Other forms of settlement may dispose of the dispute without these rights being determined or proofs being submitted, or a final adjudication being made. Arbitration is not this kind of a proceeding."

There are of course, many kinds of arbitration. However, your own management is probably interested in the arbitration of industrial or labor disputes.

To cite excellent explanation of the salient common law principles underlying arbitration, we submit the following excerpt from a report by the Office of Solicitor, United States Department of Labor:

"Common law arbitration rests upon a voluntary agreement of the parties to submit their dispute to an outsider. The submission agreement must be oral and may be revoked at any time before the rendering of the award. The tribunal, permanent or temporary, may be composed of any number of arbitrators. They must be free from bias and interest in the subject-matter, and may not be related by affinity or consanguinity to either party. The arbitrators need not be sworn. Only existing disputes may be submitted to them. The parties must be given notice of hearings and are entitled to be present when all the evidence is received. The arbitrators have no power to subpoena witnesses or records and need not conform to legal rules of hearing procedure other than to give the parties an opportunity to present all competent evidence. All the arbitrators must attend the hearings, consider the evidence jointly, and arrive at an award by an unanimous vote. The award may be oral; but if written, all the arbitrators must sign it. It must dispose of every substantial issue submitted to arbitration. An award may be set aside only for fraud, misconduct, gross mistake, or substantial breach of a common law rule. The only method of enforcing the common law award is to file suit upon it, and the judgment thus obtained may be enforced as any other judgment. Insofar as a state arbitration statute fails to state a correlative rule and is not in conflict with any of these common law rules, it may be said that an arbitration proceeding under such statute is governed also by these rules."

Many collective-bargaining agreements include provisions for the arbitration of unsettled labor disputes. If your contract does not have one, perhaps the following sample clause might be included in the next one: "If no voluntary settlement can be promptly effected, it shall be incumbent upon the parties to submit the issue to arbitration."

What type of an arbitrator have you chosen to handle your dispute?

It is said that an arbitrator should possess many important qualifications, including the following: impartiality, intelligence, sound judgment, ability to resist pressure tactics, fairness, being well-informed in the field of labor law and labor relations, knowledge and experience in job evaluation and wage incentive plans, etc. Thus, the choice of an arbitrator is of vital importance to any employer.

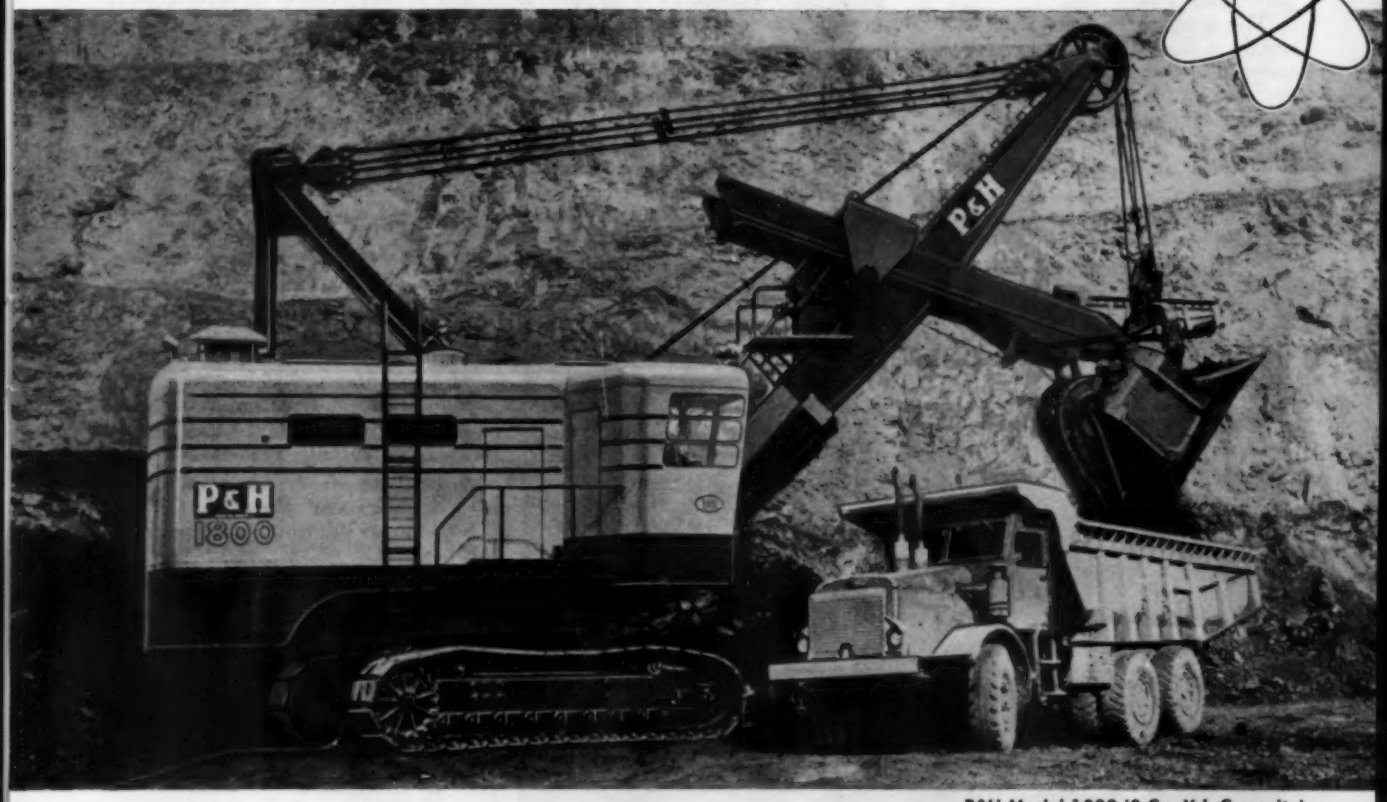
Your own company lawyer, a lawyer trained and experienced in labor law, or a professor of law undoubtedly will fit the role of an arbitrator.

It goes without saying that management should take considerable care in the preparation of its case for arbitration. It should gather accurate data and all the facts. Management should be anxious to convince the appointed arbitrator that its side of the case is the more meritorious. It all requires careful study and analysis of the information assembled.

Your labor dispute case may be presented by oral argument or by way of a written brief. Management should take a stenographic record of the entire proceedings.

Another P&H "first"

Electronic Control!



P&H Model 1800 (8 Cu. Yd. Capacity)

a great forward step in Electric Shovel performance

ELECTRONIC CONTROL — using grid control thyraton tubes for the first time on any electric shovel. Applied to all operating motions! Results in finer performance characteristics . . . more rapid response . . . better co-ordination for the operator . . . from 5% to 10% faster cycle. Thoroughly proved in more than 5 years of field installations as well as on military aircraft and combat vessels. Now standard equipment on all P&H Electric Shovels — ready to give you increased production, lower tonnage costs!

THE 1000th MAGNETORQUE*! The most highly advanced means of power transfer yet developed — now proved on P&H Shovels in the most severe types of service. Here's smoother operation, extra power, greater bail pull. Electromagnetic operation makes it friction-free, wear-free, worry-free! Magnetorque lasts the life of the shovel.

ONE RESPONSIBILITY. All electrical equipment on P&H Electric Shovels is designed and built specifically for shovel service — not adapted for it. And P&H, the builder, takes the entire responsibility for service. There's no buck-passing among suppliers. P&H service is tailored to your needs.

Write for complete information.

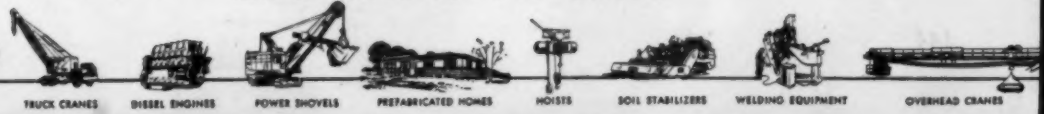
*T.M. of Harnischfeger Corporation for electro-magnetic type coupling.

P&H ELECTRIC SHOVEL DIVISION

HARNISCHFEGER CORPORATION

MILWAUKEE 46, WISCONSIN

the P&H Line



The cost of arbitration is another matter to consider. The agreement may provide that the cost will be equally shared, or that the "losing" party will pay the cost of arbitration. Arbitrators' fees generally run from $100 per day and up, excluding expenses for travel.

The purpose of arbitration is to obtain a final and conclusive settlement of a labor dispute. Consequently, the award which management receives should be of considerable interest.

If your company utilizes the arbitration process, it should insist that the union agree to accept the arbitrator's decision as final and binding; also that the union will pledge itself in an effort to discourage further individual members from engaging in such labor disputes. In any event, it would be wise to have your own company attorney sit in during the entire proceedings. It is his job to provide you with expert legal advice, information, and guidance.

Because the use and value of arbitration is practical and effective in settling labor disputes, there is probably no other method which can deal so effectively with these problems. Consequently, management should employ the method quite frequently.

The American Arbitration Association, a private group, is playing a vital role in this field. Founded in 1926, it maintains and administers adequate machinery for the settlement of labor disputes. Many businesses, small and large, use the services of the A.A.A. in solving such problems.

The record furnishes undisputed testimony that arbitration is the answer for solving labor disputes. More and more employers in our free American enterprise system are using this method each year.

For Further Reading

There are other sources of "outside" help for management, including lawyers, national trade associations, and business papers. Notable examples include the following list of publications, which contain valuable information on arbitration. Many of them provide the solution to labor dispute problems.

1. *A Guide to State Mediation Laws and Agencies,* Government Printing Office, Washington 25, D. C.
2. *Arbitration Journal,* American Arbitration Association, Rockefeller Plaza, New York, N. Y.
3. Collective Bargaining Provisions in Arbitration, *Bulletin No. 908-16,* U. S. Bureau of Labor Statistics, Washington 25, D. C.
4. *Arbitration of Grievances and Disputes Bulletin,* U. S. Bureau of Labor Standards, Washington 25, D. C.
5. Annual reports, Federal Mediation & Conciliation Service, Washington 25, D. C.

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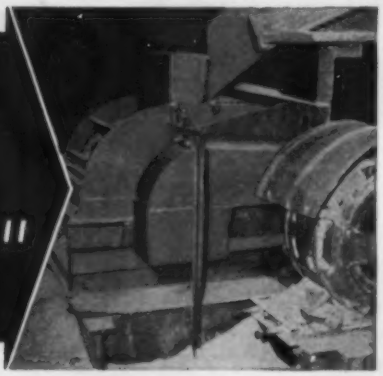
Eagle Crusher's 24x24 hammermill



On-the-job photos, above, show actual results—uniform cubical output—from a hard working Eagle Hammermill in the heart of the nation's lime stone country. Especially gratifying is the superintendent's report on this machine: "No downtime in over 4 years."

Send for more information to improve your quality and lower your costs.

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JAW CRUSHERS · IMPACT BREAKERS
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CRUSHER CO., Inc. GALION OHIO·U·S·A

A.S.T.M. Offers 1954 Booklet On Bituminous Specifications

The September, 1954, edition of *A.S.T.M. Standards on Bituminous Materials for Highway Construction, Waterproofing, and Roofing* offers form 110 A.S.T.M. standards, including 62 test methods, 42 specifications, 4 definitions, and 2 recommended practices.

One of the recommended practices is for an accelerated weathering test of bituminous materials, and the other is for bituminous mixing plant inspection.

Copies of the 448-page book may be obtained for $4 per copy from the American Society for Testing Materials, 1916 Race Street, Philadelphia 3, Pa.

More Information, Please

Use the prepaid postcard to get this literature or additional details about new equipment and products reported elsewhere in this issue.

HOIST LINE. After extensive testing in both the laboratory and the field *Union Wire Rope Corp.* has released their Tuffy hoist line especially designed for overhead, staff leg and mobile cranes, clamshells, and derricks. No more need one be confused by intricate specifications, to order the rope merely state the diameter your equipment will use, the length required, and specify the Tuffy hoist line. (1)

A HIGH-SPEED LOADER ready for heavy-duty use, the *J. D. Adams* Traveloader loads equally well from windrows or stockpiles. It features a centrally-located station, a floating feeder and moldboard which picks up material to widths of 8 ft., and a conveyor which is adjustable to accommodate all trucks. (2)

ELECTRIC VIBRATOR. Bulk materials, both fine and coarse, move rapidly, quietly, and economically with *"Viberlec"*, mounted externally on bins, hoppers, chutes, etc., and described in a new 4-pg. circular. (3)

GRINDING SUPPLIES of all types are offered in this catalog put out by the *Martindale Electric Co.* Among the items described are their chain-drive commutator grinding tools, commstones, commstone holders, cleaning stones, brush seaters, and insulation shears. (4)

SKID SHOVEL with the *Drott* Four-In-One attachment is easily converted to skid-shovel, clamshell, bullclam, or bulldozer. It may also be used as a back hoe. All of these operations are performed from the operator's seat—without changing a single pin, and while the tractor is either standing still or in motion. (5)

DUMP BODIES of heavy-duty steel and matching hydraulic hoists made by the *Galion Allsteel Body Co.* are described in this brochure. The bodies range in lengths from 10 to 13 ft., and the hydraulic hoists handle from 15 to 25 tons. (6)

TRACTOR WORK is done in half the time on 85% of the work when using the new 208 hp. Tournatractor says *LeTourneau-Westinghouse*. This folder shows how the unit's range of speeds cuts minutes from the work cycle, and how the anti-friction bearings put more horsepower to work. (7)

MORTARS, FIREBRICK, castables, combustions chambers, and plastics are among the subjects covered in this manual offered by the *J. H. Refractories Co.* The firm's wide line of castables, each of which are intended for a specific service depending on operating conditions, is described. Also included is a glossary of refractory terms. (8)

STOP CONTROL is automatically worked with this *Allis-Chalmers* unit which replaces mechanical snubbing on vibrating equipment with smooth electrical braking action. Developed specifically for stopping all types of vibrating machinery, the control stops the motor safely without imposing high torque on either the motor or drive. (9)

VERTICAL DRILL which is tractor-mounted and designed for those jobs which require maximum mobility and the rapid drilling of many vertical holes is the new model offered by *Cardox-Hardsocg*. Standard and self-propelled horizontal drills are also described. (10)

NONDESTRUCTIVE TESTING of raw materials, partially or completely finished products, and for preventive maintenance is easily effected by use of the *Sperry* Ultrasonic Reflectoscope. It measures physical dimensions where only one end or side is accessible. The unit can be leased or purchased outright. (11)

VIBRATING SCREENS which are especially designed for asphalt plants are covered in this bulletin released by the *Deister Machine Co.* It describes how the new Deister triple-deck flat screen obtains peak efficiency and production through the exclusive "drop-deck" feature, which provides increased screening area for the critical size aggregates. (12)

FORCE-FEED LOADERS which load from 10 to 20 cu. yd. per minute are shown in this catalog sheet of *Athey*. Specifications and attachments which are available are enumerated. (13)

A RECEIVER RECORDER for pneumatic and electric transmission systems, the *Bailey* recorder provides 1 to 4 continuous chart records of any measured variables which may be converted to electric or pneumatic signals. (14)

CAM CLUTCHES for indexing, overrunning, and backstop applications are included in this reference file including catalogs available from *Morse Chain Co.* The sheets list specifications, installation procedures, and lubrication information. (15)

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Use the prepaid postcard to get this literature or additional details about new equipment and products reported elsewhere in this issue.

SLURRY thickening, classification, and clarification, as well as recovery of suspended solids, is efficiently handled by *Hoyl & Patterson* cyclones. This booklet gives complete data on their cyclones and offers the facilities of their laboratory and testing apparatus for analysis of samples and testing of your slurries. (16)

ELECTRIC WELDING with automatic and semiautomatic welders are covered in this folder of the *American Brake Shoe Co.* With their machine precision submerged arc welding and hardfacing is easily accomplished. (17)

HIGH-ALUMINA refractories for various cement and lime kilns are described in this brochure of the *Laclede-Christy Co.* The firm offers one-package service including 70% to 40% liners, all grades of fireclay refractories, plactic fire brick, and castables. (18)

HOISTS, both air and electric, for efficient lifting, pulling, loading, and scraping are listed in this catalog by *Ingersoll-Rand.* Single, double, and triple construction and motor types are discussed and shown as are scraper hoist symbols. (19)

ROK-BITS made by *Brunner & Lay* are made of tungsten carbide. Charts showing shoulder union types and bottom drive types are included for every one of their Rok-Bits. Detailed recommendations are made for the use of every bit—thread type, size of drill steel and machine normally used, range of sizes with specific thread, etc. (20)

CONTINUOUS WEIGHING METERS is a data sheet which describes the Massometer, made by the *Minneapolis-Honeywell Regulator Co.*, which measures the flow-rate of free-flowing solids, and the Merchen scale meter, which provides continuous belt weighing of solids. (21)

ENGINES using gas, butane, and gasoline which range from 225 to 675 hp. are shown in this catalog of the *La Roi* Division of the Westinghouse Air Brake Co. Illustrated are the advanced design features, integral V-12 black design, the counter balanced crankshaft, and the hydraulic valve lifters. (22)

LIFT TRUCK with 15,000-lb. capacity is described in this brochure by the *Hyster Co.* Its large lifting capacity combined with greater maneuverability is the result of a narrower width and shortest overall length. (23)

TWO HYDRAULIC HOISTS manufactured by the *Heil Co.* are covered in this bulletin. One has an 8 to 11 ton capacity, while the other handles 10 to 16 tons. Among the features are: balanced valves, fast-acting controls, independently mounted pumps, and all-steel construction. (24)

DRILL RODS made of carbon and alloy steel for high-speed use are listed in this leaflet offered by the *Allegheny Ludlum Steel Corp.* Information on grades, lengths, size ranges, finishes, and tolerances is included. (25)

CRANE, shovel, backhoe, and dragline are some of the uses for the *American* 750 unit. It can be a 35-ton crane, 1½-yd. rock shovel, 2-yd. clamshell-dragline, or 1½-yd. backhoe. It features 40-in. boom tip sheaves, box section-type boom, air control, track adjustment double-face roller, and manganese steel dipper. (26)

DRAGLINE BUCKETS of medium weight and which are automatic are supplied by *Page.* They require no skillful manipulation and no jockeying of the controls to make it dig. Buckets of ⅜- to 1¾-yd. capacity are furnished with the rolled steel, single-type arch. (27)

GYRATING SCREENS for top screening efficiency in portable and stationary crushing and screening plants are offered by the *Universal Engineering Corp.* These Simplicity gyrating screens offer greater profits for you through their faster, better screening. (28)

GEARS which are Duti-Rated by *Foote Bros.* give you lower cost, longer life, and higher capacity. By hardening after cutting it is possible to combine high accuracy and maximum hardness. This means higher capacity and longer life. (29)

PULLEY LAGGING with the use of *Condersite Engineering Corp.* products increases transmission efficiency, and thereby lengthens belt life. Their use on flat belt driven machinery gives higher frictional tread to the pulley and therefore more power transmitted. (30)

ANGLING BLADE BULLDOZER made by *Balderson, Inc.* is engine frame mounted. The trunnion group attaches to the tractor engine frame, thus permitting free oscillation of the track frame while the dozer blade remains parallel to the tractor. The dozer blade may be angled to come within the 8 ft. highway width limit of many states. (31)

JANUARY, 1955

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To light Safety Fuse from one point in Secondary Blasting use ENSIGN-BICKFORD *Quarrycord*

Now you can use safety fuse and caps in multiple blockhole secondary blasting, with the added features of remote firing.

The lighting device is Quarrycord — a flexible water-resistant cord specially constructed to burn fast, at a speed of about one foot per second, with an external flame at the zone of burning. It is not affected by stray electrical currents, and is ideal for use during the thunderstorm season.

Fuse and caps are prepared in the usual way, with the addition of a connector crimped on the free end of the fuse. This connector protects the fuse powder train during rain storms, and is slotted to provide a firm, positive connection for the Quarrycord.

After the blockholes are loaded, the Quarrycord is run from hole to hole, and inserted into the slot of each connector. The top of the connector is pressed down over the Quarrycord, locking it firmly in place. The free end of the Quarrycord is then run out to a spot where it can be easily lighted.

Plan your Quarrycord hookup so that the fuse in each blockhole is lighted before the first hole goes. Several groups of boulders can be prepared in this manner, and when all is in readiness, the blaster lights the Quarrycord for each group, and walks to a place of safety. Q-1

THE ENSIGN-BICKFORD COMPANY
SIMSBURY, CONNECTICUT
Manufacturers of Primacord-Bickford Detonating Fuse and Safety Fuse
Established 1836

Ensign-Bickford Quarrycord is packed on spools in 500 ft. lengths. See your explosives supplier or write us.

ENSIGN-BICKFORD *Quarrycord*

for lighting Safety Fuse in Secondary Blasting

SYNTRON

"Pulsating Magnet"

ELECTRIC VIBRATORS

. . . for a free flow of bulk materials through bins, hoppers and chutes

3600 controllable, electromagnetic vibrations per minute prevent arching or plugging of the most stubborn bulk materials. Have no mechanical wearing parts that require maintenance. Compact—easy to install. Eliminate equipment damage from rodding, poking and sledging. In models and sizes for any bulk handling installation.

SYNTRON EQUIPMENT Reduces Handling Costs—Speeds Production

TEST SIEVE SHAKERS

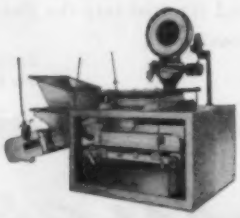
High speed, accurate sizing of test samples. Positive control of time and speed for uniform testing.

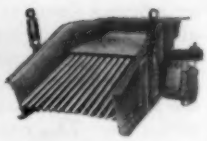
Self-Contained GASOLINE HAMMER Rock Drills

2000 powerful blows per minute with automatic rotation of bit. Drills holes up to 2" in dia.

WEIGH FEEDERS

Controlled, accurate feeding by weight. Electronic controls correct load variations automatically. Low cost, continuous operation for feeding from a few pounds to hundreds of tons per hour.





VIBRATING GRIZZLIES

High speed, controllable feeding and scalping in one operation. Low cost, easy handling of heavy tonnages at any production speed.

Write today for complete performance and specification data in illustrated catalogue — Free.

SYNTRON COMPANY
385 Carson Avenue Homer City, Penna.

Kansas Limestone Producer
Adds New Equipment for Peak Capacity

CONCRETE Materials Company, with offices at Cedar Rapids, Iowa, operating quarries at several points points in the Midwest, has made important improvements to its plant at Moline, Kans. which now enable the firm to ship an average of over 100 carloads daily. The latest program involved the installation of a completely new and highly efficient primary crushing, conveying, and surge storage setup in the quarry. Included is a Cedarapids 5360H heavy-duty double-impeller impact breaker which replaces three 2540 primary jaw crushers formerly used at this quarry. A heavy-duty apron feeder and a 30-ton steel hopper were also added. Earlier 12 new screens were installed and many other additions and changes were made.

In the Concrete Materials Company's quarry near Moline, Kans., a 2½-cu. yd. shovel is loading rock into a 22-ton truck.

The company originally started to operate the Moline quarry to furish materials for an airport job at Coffeyville, Kans., in 1942. Upon the completion of that job, because of the demand for limestone in the Kansas area, Concrete Materials continued operations, with periodic expansions, to the present time. Stone is now shipped as far west as Colorado, north into northern Nebraska, and east approximately 80 miles. Moline is about as far west as any good limestone deposit, which probably accounts in part for such long shipments. This concern can produce a high type of specification limestone, and with the present grading and screening setup it is capable of turning out this product in practically any size. The main sizes now include 1½-, 1-, ¾-, and ⅜-in. cover material and agricultural limestone. The plant requires a staff of 45 people, and it is operated 10 hours a day, six days a week.

Stripping of overburden is done under separate contract by the Bloom Construction Company, Overbrook, Kans.; this firm uses one 2½- and one 1½-cu.-yd. shovel for loading four 12-ton Euclid trucks. Three D8 Caterpillar dozers are also used in stripping operations. For drilling and stripping operations in the limestone deposit Concrete Materials uses three wagon drills plus one for standby. Three Northwest shovels—one model 80D 2½-cu. yd., and two model 6's 1½-cu. yd.—load four Euclid 22-ton end-dump trucks; one additional truck is kept as a standby.

The rock is hauled from the quarry and dumped into a Cedarapids model CMF heavy-duty apron type feeder with cast manganese flights. This feeder is 50 in. wide by 14 ft. 6 in. long and is driven by a 20-hp. motor. A 30-ton steel hopper is used in connection with the feeder, the combined weight being 61,000 lb.

The feeder discharges into the new Cedarapids double-impeller impact breaker, which can take rock up to 53 by 60 in. in size. The weight of the complete breaker is 168,400 lb. Cast-steel side plates vary from 3 to 4½ in. in thickness in different parts of the breaker. Manganese steel liner plates 2 in. thick are placed inside the breaker, which is approximately 14 ft. 3 in. high and 20 ft. long. Two 200-hp. electric motors furnish the drive, one for each impeller. The breaker has been producing 800 t.p.h., and could handle greater quantity if required. It was installed in a 17-ft. deep concrete pit, with

A truck dumping rock into an apron-type feeder-hopper over the double-impeller impact breaker. The under-breaker conveyor operates under the full 20-ft. length of the feeder, the whole setup being installed in a 17-ft. deep concrete pit.

Left: The No. 1 under-breaker conveyor discharging into a surge bin with a metered gate and an apron feeder and then to the No. 2 conveyor.

This shot shows the point at which the No. 2 conveyor discharges into another surge bin with a metered gate and an apron feeder, thence to conveyor No. 3.

The No. 3 conveyor discharges to the stockpile from 73-ft. above. This stockpile serves as a surge pile for the secondary plant. The material moves from the pile to the plant via tunnel conveyor (No. 4), fed by an apron feeder and a metering gate beneath the surge pile.

heavy concrete sidewalls, foundations and footings to carry the heavy loads.

A special feature of the installation is that the under-breaker conveyor No. 1, extending under the full 20-ft. length of the feeder, will receive any material falling off the feeder flights, thus helping to keep the pit clean. All other feeder-conveyor connections in the quarry are installed in a similar manner. The No. 1 conveyor, 42 in. wide and 120 ft. long is inclined to discharge material into a square steel surge bin set on steel framework. The bin has a metering gate and an apron feeder below, to control the discharge onto the No. 2 conveyor, which is 30 in. wide and 640 ft. long.

Material from this conveyor is similarly discharged into a surge bin, metered gate, and apron feeder, to conveyor No. 3, which is 36 in. wide and 180 ft. long. This feeder discharges the material from its 73-ft. high terminus to a stockpile which acts as a surge pile for the secondary crushing and screening department. A tunnel under this stockpile contains an apron feeder and a metering gate which feeds material to the No. 4 30-in. by 265 ft. conveyor, passing from under the surge pile area to the secondary screening department.

Material thus entering the secondary plant is discharged onto a Cedrapids 4- by 10-ft. single deck vibrating scalper screen. Oversize from this screen is discharged into a 40-in. Williams hammermill. Material through both screen and hammermill is split and divided onto two conveyors which actually are the start of two separate secondary crushing plant setups. The split is accomplished by a flop-gate arrangement controlling the amount of material which goes to either conveyor. Both are 24 in. wide; one is 178 ft. long and the other 172 ft. long. In the event of a breakdown or at the time of changing screen cloth on one side of the plant, material can be routed over the other conveyor, allowing a 50 percent operation at all periods.

Discharge from both conveyors is to stationary, inclined scalper screens placed ahead of two Cedarapids 4- by 12-ft. double-deck horizontal screens. All fines are by-passed on to the next stage in the secondary plant, with oversize off the top decks being discharged into two Cedarapids 4024 roll crushers. All material through these screens and from the roll

crushers is conveyed on up into the screen house hopper of the plant and there again discharged onto a pair of stationary double-deck dry screens. Fines passing the second deck are taken on through the plant and discharged on to the fines conveyor and carried to a stockpile. Material from the top and second decks pass on to Cedarapids horizontal dry and wet screens which size out and segregate the various sizes desired.

Fourteen Cedarapids horizontal screens are used in the secondary plant operation: one 4- by 10-ft. single-deck scalper; two 4- by 12-ft. double-deck screens, used ahead of the roll crusher and dry screens; four 4- by 12-ft. double-deck dry screens; three 3- by 8-ft. triple-deck wet screens; two 4- by 12-ft. double-deck wet screens. Spray bars are used on the top of all wet screens.

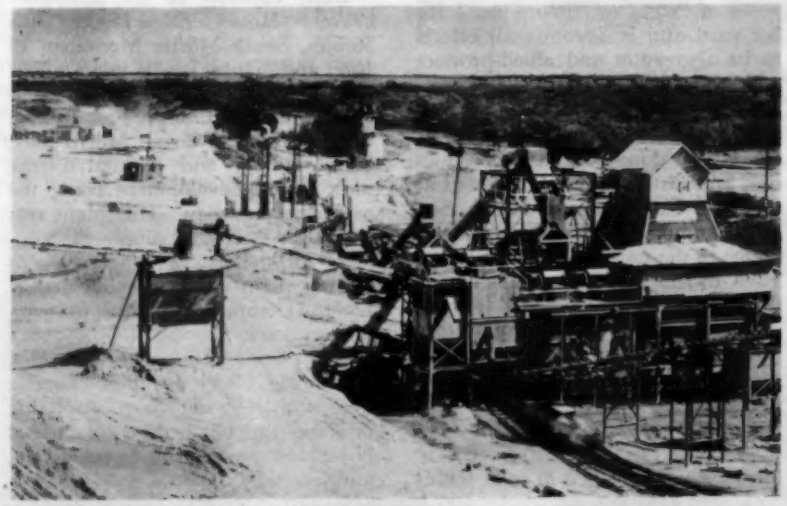
Agricultural limestone is carried out of the plant on a side conveyor to a stockpile. A flop-gate arrangement permits loading a 10- by 10-ft. overhead steel bin for truck loading when required. Other sizes of products are presently conveyed either to discharge into trucks or into railroad gondola cars. At present two cars may be loaded simultaneously. However, additional conveyors and facilities are being installed to permit loading cars from the top, and to double the loading at the other discharge point. Thus it will be possible to load four cars at the same time in the future.

There are two truck scales and one railway scale for weighing materials as shipped. Water for washing the material is pumped from a nearby stream; it is discharged into a man-made lake which is used as a settling tank to clear the water before it is drained back into the stream or is re-used.

The first screening operation in the secondary plant. The terminal of the No. 4 conveyor from the tunnel opening can be seen at the left. It discharges material on the scalping screen, the oversize going into a 40-in. hammermill. Twin conveyors carry the material through the intermediate screens.

V. H. Mussman, plant manager for the Moline division of the company, has been with this operation since its inception. T. H. Metcalf is superintendent, having been transferred to Moline in 1948. Other key men include Jim Barnens, chief electrician and maintenance man; George Kinder, pit foreman; Coleman Schemwell, foreman of the secondary plant and loading; Ben Ryan, plant manager; and George G. Diebold, office manager.

Medusa Portland Cement Company officials revealed that $66,000 had been divided among the 205 employees at the Toledo, Ohio, plant as incentive bonuses. They stated that these payments had been made because the firm had had a successful year. Total payments (at eight plants) amounted to $485,000.



From a vantage point atop the stockpile one has this view of the secondary crushing plant. The twin conveyor setup discharges onto twin stationary screens placed ahead of the double-deck horizontal screens. From these the oversize goes into the roll crusher. The dual arrangement of the conveyors continues to the screen house (off right) for further classification. At the left is the aglime truck-loading bin and by-pass to the stockpile.

MARTINDALE

COMMSTONES

Made in 5 grades for commutators and brass or copper slip rings and 3 grades for cast iron or steel slip rings in all necessary styles and sizes.

TYPE C COMMSTONE HOLDER

Holds Commstones rigid and true for concentric resurfacing of commutators and slip rings while running at normal speeds in their own bearings. Grinds commutators up to 4¾" wide. Used with two Commstones in stone holder or one Commstone in 2" box.

Send for 64-page Catalog No. 29 of Maintenance, Production and Safety Equipment.

MARTINDALE ELECTRIC CO.

1363 Hird Ave. Cleveland 7, Ohio

From the air the Southern Pacific Milling Company's operation at Santa Maria, Calif., looks like this. At the left is the concrete batching plant, with trucks moving up for charging. In the center the aggregate-storage and recovery system are seen; at the right of the stockpiles is the asphalt plant.

Transition at Southern Pacific Milling Co.

another ON THE SPOT report

By HARRY F. UTLEY

SOUTHERN Pacific Milling Company is a familiar name indeed to old timers in the south-central coastal area of California. This year (1955) the company is observing its 70th anniversary in business in the sprawling tri-county region comprising Santa Barbara, San Luis Obispo, and Ventura counties. Organized in 1885 to serve the ranchers and farmers of these counties when California was young and the area predominantly agricultural, the concern began erecting a chain of warehouses along the tracks of the Southern Pacific Railroad, dealing in feed, seed, farming implements and, a little later, lumber, millwork, and building supplies.

Today the original name is about all that remains of the original venture, the character of the business having changed completely to conform to the tremendous growth and development of California in the last decade or two. S. P. Milling is now exclusively in the business of producing and distributing aggregates, ready-mixed concrete, and asphaltic mixtures.

First venture along this line came about in the years just preceding World War II, when the company set up a batching plant to furnish concrete to Camp Cooke, near Santa Maria, Calif. Since then the concern has gradually acquired sand-and-gravel deposits, has erected additional plants, and has purchased existing operations, until today it is operating 13 plants in 8 or 9 cities in the tri-county area. It has disposed of its last warehouse and lumber yard and is devoting all efforts to its aggregates and allied-product operations.

Main offices of the company remain in Santa Barbara, and from its central headquarters there production and distribution are directed at the Paso Robles, Santa Maria, San Luis Obispo, Morro Bay, and Goleta plants to the north; and at the Montalvo, El Rio, and Santa Paula operations to the south. Jake Will is president, having been elevated to that position from his former post as vice-president in charge of aggregate operations, in July, 1953. Mr. Will joined the company about the time it established its first batch plant. He formerly was engaged in road building and general construction in Ohio. His executive assistant, Milton F. Masters, was appointed to that job early in 1954 after serving some eight or nine years as supervising engineer for the California Department of Highways. P. E. Holmes and L. C. Root are, respectively, north and south operations managers.

Daily capacity of the sand-and-gravel plants located near Paso Robles, Santa Maria, Montalvo, El Rio, and Santa Paula totals about 5,000 tons. Batch plants are in operation at San Luis Obispo, Paso Robles, Goleta, Santa Maria, Morro Bay, Santa Paula, and Montalvo, the most recent development being the one at Morro Bay. This plant was set up primarily to supply the concrete for the new $44,000,000 generating plant of the Pacific Gas & Electric Company scheduled for completion some time in 1956. Truck mixers serving the various batch plants are Challenge high-capacity units for the most part. Asphaltic mixtures are batched in established hot plants at El Rio, Santa Paula, and Santa Maria.

Pioneer warehousing firm is now engaged exclusively in production of aggregates, ready-mixed concrete, and asphalt

S. P. Milling's latest acquisition is the 400-acre Montalvo property, established in 1928 as the Montalvo Rock Company by L. R. Howard. This 150-t.p.h. aggregates plant is supplied from the bed of the Santa Clara River, the deposit being worked by a dragline. Both revolving and vibrating screens are used to scalp and classify the aggregates; crushing equipment includes two jaw machines and an Allis-Chalmers Hydrocone.

Other aggregate-producing plants in the Santa Clara River basin are those at El Rio and at Santa Paula. The El Rio operation concentrates largely on turning out crusher-run road-base material. A Diamond portable plant is an integral and permanent part of the crushing-and-screening set-up. Asphaltic material is prepared in a Madsen 4000-lb. hot plant at El Rio and by a similar unit of slightly smaller capacity at Santa Paula. Aggregates production at Santa Paula is mainly washed-and-sized material. Being the farthest up-river of the three Santa Clara River plants, the deposit at Santa Paula is deficient in fines below No. 50 mesh. This deficiency is made up by trucking in some fine sand from a pit in Grimes Canyon, about 12 miles distant, plus the use of a Cottrell Whirlcone in the classifier overflow circuit at the plant.

The operations in and around Santa Maria, including the aggregates plant on the Sisquoc River nearby, are perhaps the largest and most complete of any in the cities served. The production flow-sheet at the Sisquoc operation is interesting. It involves a Stephens-Adamson 2-deck scalping screen which handles the pit-run and the product of a Wheeling 15- by 38-in. primary jaw crusher, a Traylor gyratory and a small Cedarapids jaw crusher being in secondary closed circuit with the screen. All products are then carried by a 375-ft. long belt conveyor up to a Stephens-Adamson four-deck screen, where sizing and washing of five coarse aggregates is accomplished. These range from 5/16 to 2½ in., and each size is separately stockpiled. Throughs are processed for sand, dewatering and classification being accomplished by a S-A sand wheel and a drag. Fine fractions in the overflows are extracted by a Cottrell 25-in. Whirlcone. A Kennedy-Van Saun No. 20 Cuber crusher hammers out additional

Newest batch plant is this installation at Morro Bay, erected primarily to furnish about 60,000 cu. yd. of concrete for a power plant. This plant, now under construction, is scheduled for completion in 1954.

The company owns and operates several bulk-cement truck-trailers, such as the one at the left, to serve its various ready-mix plants. This is a view of the Goleta plant.

The Montalvo plant, most recent acquisition of the firm was first established in 1928. Lined up before the plant are some of the company's delivery and mixer trucks.

AJAX

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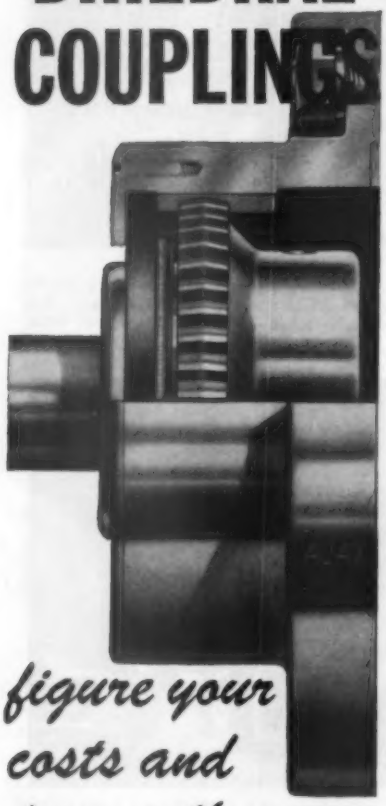

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● Ajax Dihedral Couplings are made to order for tough misaligment jobs. They handle misalignment heretofore considered excessive on stationary and mobile equipment involving weaving structures, heavy horsepower and shock loads.

One shutdown of your yard or plant makes the extra cost of an Ajax Dihedral Coupling insignificant!

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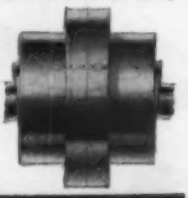

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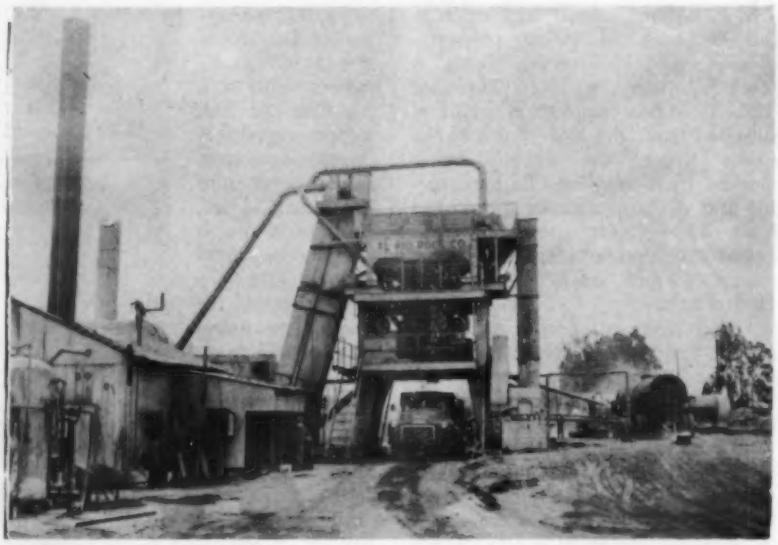

The El Rio asphalt-mixing plant is similar to those used at the Santa Maria and Santa Paula operations.

A view of the El Rio sand and gravel plant, which is one of five operated by Southern Pacific Milling Co.; daily capacity of all plants totals 5,000 tons.

granular fines from excess coarse material and serves, too, as a soft-stone eliminator.

The company's operations along U. S. Highway 101 in Santa Maria proper include aggregate storage and reclaiming facilities, plus processing equipment for the making of asphaltic fines used in an adjoining Madsen 3,000-lb. hot plant. Concrete is batched on the premises by a Butler plant. A complete laboratory was recently established on the property in Santa Maria. These facilities are equipped to make complete analyses of aggregates, strength tests of concrete specimens, as well as sodium sulphate, sand-equivalent, colorimetric tests, etc.

The Paso Robles aggregate plant is situated about 3 miles south of that city. It has a capacity of about 125 t.p.h. of washed and graded material. Equipment used in the processing includes Cedarapids and Bodinson screens, a Symons 3-ft. cone crusher, an Eagle 44-in. twin-screw sand classifier, a Stedman shale eliminator, and a Whirlcone for the recovery of fines from the overflows. Concrete is prepared in a Willard batcher at a distributing plant in the center of Paso Robles.

Headquarters of the Southern Pacific Milling Co., are located in a modern office building in downtown Santa Barbara. Sales promotion is augmented by regularly scheduled advertisements in the various daily newspapers in the area. Advertising and public relations are directed by Ed Kemble.

Portable Gravel Plant Economically Produces 60,000-Ton Maintenance Stockpile in Montana

WHEN a 60,000-cu. yd. gravel crushing job came up early this year in the Kalispell Division of the Montana State Highway Department, there were many inside guesses regarding bidders, methods, and prices. According to Montana's Construction Department at Helena, the 1953 average for that type of maintenance-by-contract work had been 77.5 cents per cubic yard. The Kalispell job was not easy. It called for nine portable plant setups, some difficult pit conditions, and about 250 miles of travel in the nine moves. The best inside guess, taking these factors into consideration, was something close to $1.00 per cubic yard. The bids were opened, and when the smoke had cleared, the Butte, Mont., contracting firm of Naranche and Konda had bid a flat 70 cents per cu. yd.

Production of the first gravel stockpile was started early in April at a pitsite near Lakeside, and about two months later the last of the stockpiles was completed at the ninth pit location. The entire job was handled by a newly purchased Pioneer Model 46-VE all-electric portable gravel plant, complete with a 40- by 22-in. roll crusher, a 3½-deck 4- by 12-ft. vibrating screen, and a 10- by 36-in. jaw crusher. The new plant replaced an older Pioneer 40-V model.

Power for the crushers on the new plant is supplied by a Caterpillar D13000 diesel engine through a Blood Bros. slip joint, universal, and drive shaft. This direct-drive feature proved to be valuable for the job, particularly at the Lakeside pit, where working space was limited; in fact it would have been difficult to set up the plant at that site if a long drive belt had been used. Auxiliary power on the plant consists of a D13000 diesel-electric set, which generates electricity for the various motors on the plant conveyor system.

In actual operation the pit-run gravel was excavated and shoved by a Caterpillar D8 tractor-bulldozer to a portable wheel-mounted hopper, set over a Pioneer 3-ft. apron-feeder. Finished gravel, minus ⅝-in. size, leaving the plant was belt-conveyed to a Pioneer 30-cu. yd. hopper, which was tapped by several trucks hauling to the nearby stockpile.

Major features of the new portable plant include the following: a bottom deck feed which provides a more effective screening area, permitting a larger load to be handled; easy adjustment of the jaw crusher while the plant is in operation; and a swivel arrangement which allows the hopper and apron feeder to be swung in a wide arc, permitting the plant to be operated for a longer period without moving. Ease of jaw

Above: A general view of the Naranche and Konda portable gravel plant operation in Montana supplying maintenance road material. Pit-run gravel is bulldozed to the primary feed hopper, crushed, and screened; and the finished product is fed to a 30-cu. yd. truck hopper.

Right: Another view of the all-electric one-unit portable gravel plant. The minus ⅝-in. gravel is trucked from the storage hopper shown on the left to the stockpile.

AJAX

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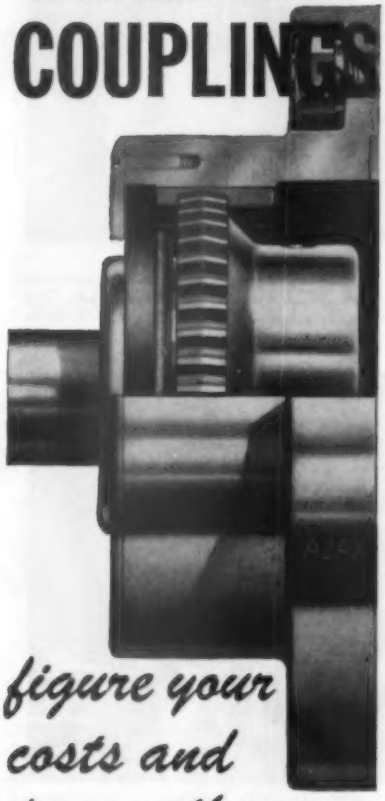

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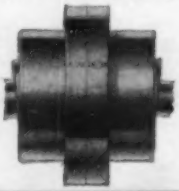

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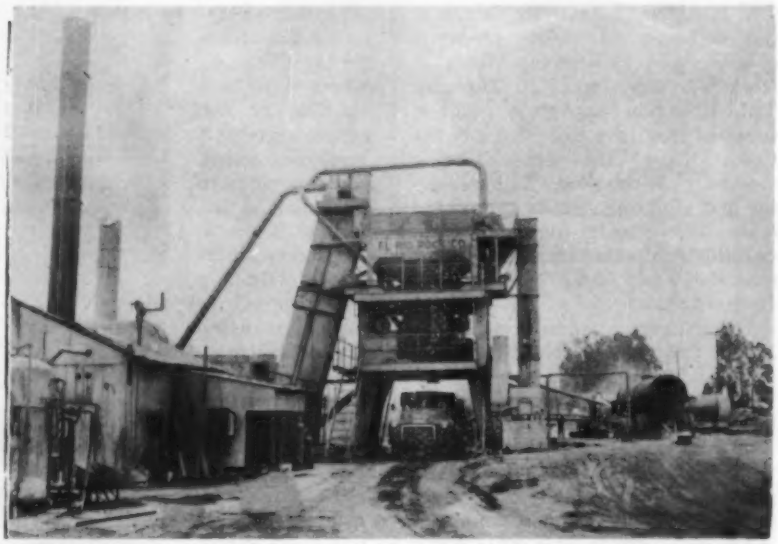

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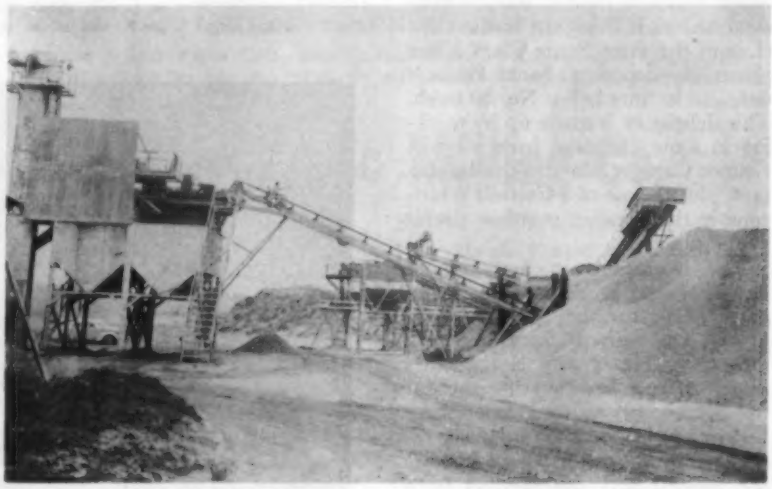

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Right: Another view of the all-electric one-unit portable gravel plant. The minus ⅝-in. gravel is trucked from the storage hopper shown on the left to the stockpile.

A closeup of the portable plant, showing the diesel-electric generator in the foreground and the truck-mounted diesel engine direct-connected to the plant's jaw and roll crushers.

crusher adjustment enables the operator to adjust quickly to changing pit conditions, and thus maintain a balance of work between the jaw and roll units.

At the first pit site, the new plant turned out a 4,000-cu. yd. stockpile of ⅝-in. minus maintenance gravel within three days under difficult operating conditions.

The first pit consisted of alluvial pit-run gravel, of which about 50 percent required crushing to meet the following specifications:

Size Screen	Percent Passing
⅝	100
No. 4	40-75
No. 10	35-60
No. 200	4-10
PI	15 or less

It was early spring, and the pit contained much heavier moisture than it would later on in the summer. The only labor concession made to the pit was the hiring of a laborer to throw out the worst oversize rocks coming up the input feeder conveyor. Aside from that, the entire pit-run supply was passed through the plant.

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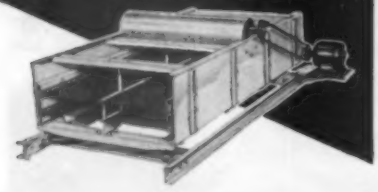

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There's a model to fit your particular requirement, priced within the smallest budget.

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UNIVERSAL VIBRATING SCREEN CO.

Racine, Wisconsin

Quality Screens Since 1919

At other pit sites material was produced at a similar rate *i. e.*, well over 1,000 cu. yd. per day. Occasional night operation was made possible by the installation of a number of floodlights. In moving from pit to pit, the contracting firm was able to keep the portable plant, even the roll crusher, intact; because of the nature of the equipment, however, the firm had to obtain a special permit from the State of Montana. Setup time at each pit site required about 4 hours.

Naranche and Konda produced the nine stockpiles under Montana's basic contract system policy. The crushed material is being used by maintenance crews for premixed cold patching work, and especially for "half sole" repair bituminous jobs, roadmixed during the warm summer months, which will reclaim many a section of worn pavement. It is definitely a maintenance function which, taken over by a contractor with modern equipment and a sharp pencil, has lowered costs for the Montana State Highway Commission. It has helped stretch the higher dollar. That is especially important in Montana, too, because the state is the third-largest in the nation. Its entire population is only 600,000, no greater than that of the city of Seattle, Wash.

Because of the success of this operation, that is, of handling high tonnage at low cost, the firm bid hard at a recent Montana highway letting; it was successful in landing five jobs in the state, ranging from the western to the eastern parts. These jobs will be handled by the

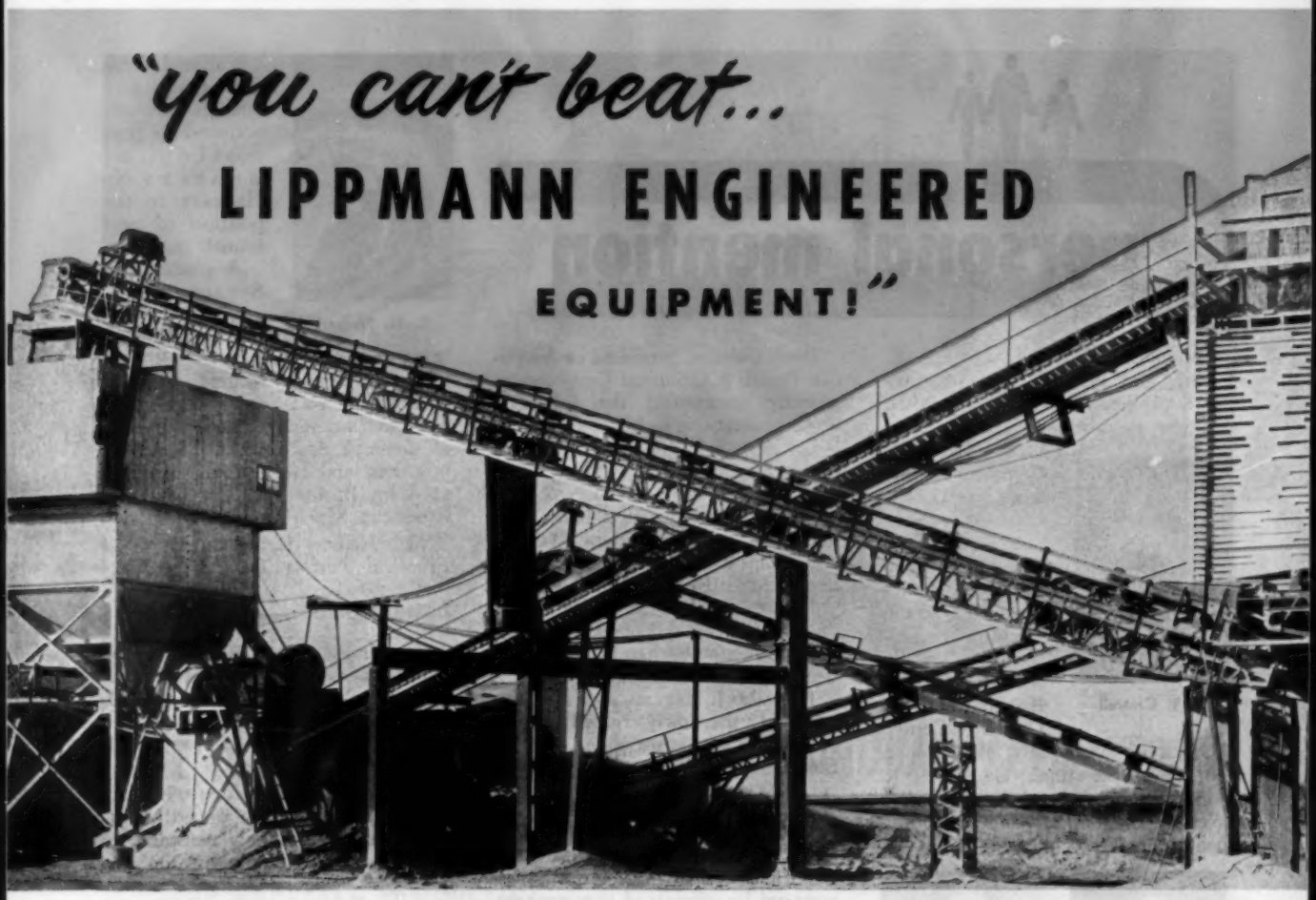
M. J. Naranche, who is in charge of the company's operations.

46-VE plant and a second Pioneer portable plant (an older unit). Since it is well over 600 miles from one side of Montana at Kalispell to the North Dakota line at the other, it will be necessary for this equipment to make fast long moves to get rid of one job and start on the other.

M. J. Naranche has personal charge of the new crushing plant and its allied equipment. John McGee is plant superintendent.

Tobin Quarries, Inc., Kansas City, Mo., has closed down its quarry in Alexandria, S. D., following completion of the Ft. Randall dam and the Chamberlain, S. D. bridge, into which projects most of the production of 1,500,000 tons of crushed granite has gone since the opening of the quarry in 1949.

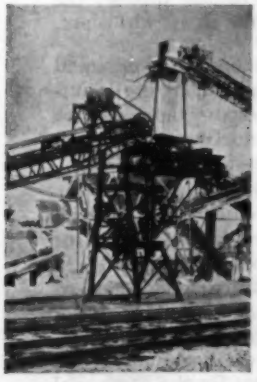
"you can't beat... LIPPMANN ENGINEERED EQUIPMENT!"



Above, a LIPPMANN conveyor now in use at the Francesville Stone Company in northern Indiana. Mr. R. E. Ward, heading this successful aggregate operation, wrote the headline for this ad himself, and went on to say:

"We've Used Lippmann Since 1946!"

LIPPMANN CAR LOADER
Swivels in all directions! Most efficient loading method in all the industry!



"We have in operation, at the present time, 97% of the original equipment and that has been operating at 99% efficiency since installed." *That's a direct quote from one of the foremost aggregate producers in Indiana — a man who knows what to expect from Lippmann Engineered equipment!* At Mr. Ward's operation, Lippmann Roll Type Secondary Crushers are now economically producing 40 to 50 tons of AAA agricultural lime per hour; Lippmann Belt Conveyors, after more than 7 years of continuous service, still hustle these tremendous loads along with practically NO maintenance. *That* kind of service means PROFIT, and in the aggregate industry, *LIPPMANN profit* leads the pack . . . confirming Mr. Ward's statements, as well as the statements of many others who consistently praise the performance of Lippmann Jaw Crushers, Pulverizers, Screens, and washing plants the world over. You too can "Look To Lippmann" for those extras in quality that spell more production and lower costs. See your Lippmann dealer or contact Lippmann Engineering Works, 4607 W. Mitchell St., Milwaukee 14, Wis.

LEW

LIPPMANN ENGINEERING WORKS
4603 W. MITCHELL STREET
MILWAUKEE 14, WISCONSIN

personal mention

LEWIS B. CROWELL, GEORGE E. KOCH, and W. J. SPRAU were recently promoted to newly-established positions as production managers in the National Gypsum Company organization.

L. B. Crowell

Mr. Crowell will be responsible for the firm's Eastern Gypsum Division, consisting of plants in Akron, Ohio, Baltimore, Md., Clarence Center, N.Y., New York City, Portsmuth, N.H., and Savannah, Ga.

Mr. Koch will head the company's Western Gypsum Division, including facilities in Fort Dodge, Iowa, Medicine Lodge, Kans., National City, Mich., Rotan, Tex., and Shoals, Ind.

G. E. Koch

W. J. Sprau

Mr. Sprau will have charge of the Paper Division, with plants in Garwood, N.J., Kalamazoo, Mich., Newburgh, N.Y., Pryor, Okla., and Mobile, Ala. (insulation board).

VIRGIL ESTES, formerly Los Angeles field manager of United States Gypsum Company's Quality Section, has been named Pacific manager of field quality in a recent reorganization move. This is a new position; however, Mr. Estes will continue to maintain his headquarters in Los Angeles.

Also announced were the appointments of R. T. MCCLELLAND as assistant field manager, Quality Section in the Central Pacific Division, and R. L. WELTY as field manager, Quality Section in the North Pacific Division.

Peter Colefax, president of American Potash & Chemical Corporation, recently announced the following three promotions in his concern:

GEORGE S. WHEATON, assistant vice-president of the Eston Chemicals Division, has been elected vice-president in charge of that division, and will have responsibilities in American Lithium Chemicals, Inc., and Western Electrochemical Co.

THOMAS F. EDSON, assistant vice-president in charge of research and development, was named vice-president in charge of special engineering.

RICHARD J. HEFLER, secretary, was named to the newly-created position of assistant to the president, in addition to his duties as secretary.

The retirement of MANUEL GODINEZ, design engineer for the Universal Atlas Cement Company, after 19 years of service, was recently announced by officials of that concern. Mr. Godinez was the plant designer for most of the company's plants erected during his tenure of service; he was also the originator of much new machinery used in Universal Atlas plants.

Mr. Godinez, who is a native of Guanajuato, Mexico, received his early education in Mexico City, and at Syracuse University. He worked with various firms, including eight years with the J. C. Buckbee Company, before joining the staff of Universal Atlas.

COL. WILLIAM N. CAREY has announced that he will retire May 1, 1955, from his post as executive secretary of the American Society of Civil Engineers. He will be succeeded by William H. Wisely, who is at present executive secretary of the Federation of Sewage and Industrial Wastes Association.

PAUL F. KEATINGE was recently elected vice-president and director of sales of Trinity white cement for the General Portland Cement Company, Chicago, Ill. Mr. Keatings became associated with the Trinity Portland Cement Company in 1940. This firm later became the Trinity Division of the General Portland Cement Co.

C. N. Helbert

National Gypsum Company officials have announced the promotion of CHARLES N. HELBERT to the position of personnel manager.

A graduate of Syracuse University, Mr. Helbert was formerly assistant to the personnel manager. Prior to joining National Gypsum in 1951, he had been supervisor of personnel testing at Ansco, a division of General Aniline and Film Corporation, and employment manager at John B. Stetson Company and American Machine and Foundry.

Mr. Helbert is the author of *A Practical Testing Program* for the National Industrial Conference Board Reports.

Appointment of RAYMOND W. WEICKER as superintendent of the Bethlehem quarry and slag plant, Bethlehem Steel Company, has been announced. Mr. Weicker succeeds the late Paul E. Sellers.

At the same time three other appointments were announced: EARL K. LEEDECKER is now assistant superintendent in charge of the slag plant; FRANCIS H. THOMAS is master mechanic at the Bridgeport quarry; and WILLIAM H. SPOONER is superintendent of the Sparrows Point foamed slag plant.

Mr. Weicker, a graduate of Lehigh University, has worked for Bethlehem for 19 years. He started as a trainee at the Hanover quarry and was subsequently transferred to Bridgeport. Later he became general foreman, and four years ago he was named master mechanic. His new responsibilities at Bethlehem include superintendence of the quarry, the slag plant, and the black top plant.

FRANK LOVELL has been appointed assistant sales manager of the Louisville Cement Company, according to an announcement issued by J. H. Mallon, vice-president.

Mr. Lovell will be in charge of the promotional activities of the sales department, and will be responsible for promotional work on the sale of Brixment, a masonry cement mortar, and natural cement. The latter product has been made by this concern since 1831, when it was founded to produce cement for the first canal around the falls of the Ohio River. Mr. Lovell has been with Louisville Cement since 1941, beginning as a territory salesman.

THE NEW UNIVERSAL 293Q TWINDUAL PACEMAKER

combines peak production with maximum portability

TOP CAPACITY PRODUCTION

The TwinDual Pacemaker gives you three full stages of reduction for top capacity—a Universal overhead eccentric jaw crusher in the first stage and a TwinDual roll crusher for the second and third stages.

No other single unit plant offers so many big-profit advantages. Big primary jaw crusher accepts large rock—lets you work gravel pits containing big boulders. Exclusive TwinDual two-stage roll crusher gives top capacity secondary crushing. Its high ratio of reduction permits the primary jaw to operate at 50 to 100% wider discharge opening. This results in greater capacity—less jaw wear. Larger inclined gyrating screens with full screening area allow 20 to 25% greater output. All operations from apron feeder to delivery conveyor are driven through one single power unit.

For top capacity with three stages of reduction—and a bonus in longer crusher life, lower horsepower requirements and a better quality finished product, choose a Pacemaker. Available in five models for pit or quarry operation. Get complete profit making facts now.

LOW TRAVELING WEIGHT

The primary jaw crusher, apron feeder with grizzly by-pass, operator's platform and structural supports are all mounted as a single unit on skids. This primary unit is bolted to the main truck frame. When highway weight limitations must be met, this unit may be quickly skidded to a low bed trailer and transported separately.

Main plant section hooked up for traveling.

Primary unit skidded to low bed trailer to meet highway weight restrictions.

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UNIVERSAL ENGINEERING CORPORATION
619 C Avenue N. W., Cedar Rapids, Iowa
Subsidiary of Pettibone Mulliken Corporation, 4700 W. Division Street, Chicago 51, Illinois

Moderate cost . . . light on labor little maintenance . . . BUT

Crescent Scraper of 5-cu. yd. capacity—rigged for gravity return—shown returning to excavation point in the pit. Ask for Catalog A and Field Report 214.

SAUERMAN EQUIPMENT

Check digging power . . . rate of haul . . . clean dumping. Add labor economy . . . low upkeep. . . . personnel safety . . . moderate power consumption. Total up the score . . . you'll choose one of these Sauerman Machines for your operation.

DRAG SCRAPER: *best* for pit or hill excavation, reclamation or general handling of materials, wet or dry. Serves as rapid, long range conveyor. Sizes ⅓ to 15 cu. yds.

SLACKLINE CABLEWAY: *best* for deep digging — especially underwater — and conveying to a high delivery point. Reaches down a hundred feet or more . . . spans up to 1000 ft. . . . sizes ⅓ to 3½ cu. yds.

DRAG SCRAPER STOCKPILER: *best* for profitable handling of sand and gravel, ores and chemicals. Low on first cost, plus economical one-man operation.

CRESCENT SCRAPER ON BOOM MACHINE: *best* for increasing the work capacity of any boom machine on backfilling and grading jobs. When scraper is used with track cable and trolley, machine range is greatly extended.

Call on Sauerman's *experienced* engineers for the size and type system *best* suited to your digging, hauling or materials handling requirements. Write for catalogs . . . ask for idea-packed Sauerman News.

Slackline cableway performs difficult excavation of non-caving material from deep pit. 70% rock and 30% colloidal sand posed tough digging job. Ask for Catalog C and Field Report 216.

Two small scrapers reclaim different sizes of crushed stone from adjoining piles to belt conveyors delivering to a common hopper used to load cars with straight or mixed sizes. Ask for Catalog E.

Crescent on boom machine dumps large load of wet peat. Bucket is gravity-returned on track cable to digging point. Ask for Catalog J-1 and Field Report 219.

SAUERMAN BROS. INC.

634 S. 28th Ave. | Bellwood, Ill.

E. W. BAUMAN, managing director of the National Slag Association, Washington, D. C., has been elected president of the Engineers Club of Washington.

G. B. HALLOWELL JR., formerly district manager of the Lake Shore District, has been appointed assistant to H. F. Sadler, vice-president in charge of sales of United States Gypsum Company. He replaces A. B. COOK, who has been named sales manager of U.S.G.'s Plastering Materials Division.

Mr. Hallowell joined U.S. Gypsum as a sales trainee in their St. Louis office in 1947. He was a line salesman from 1947 to 1952, when he was promoted to assistant sales manager of the Plastering Materials Division, and was made Lake Shore District manager in 1953.

F. B. BENTON, formerly assistant district manager of the Dallas District, has been named Lake Shore District manager.

Mr. Benton joined U.S. Gypsum's sales training program in Dallas in 1946 and has been connected with that office and the Houston office since that time. His office will be in Chicago.

Appointment of E. B. MITCHELL JR. as vice-president and manager of the Texas Division of the Lone Star Cement Corporation, to succeed the late J. Bryan Oldham, has been announced by H. A. Sawyer. Mr. Mitchell has been connected with the firm for 33 years and has been division sales manager at Dallas since 1942.

F. NELSON BANE is now the division sales manager succeeding Mr. Mitchell, and WILLIS R. GREER becomes assistant division sales manager.

DONALD L. DERROM has been made assistant to the director general of Cementos Anahuac, S.A., Barrientos, Estado de Mexico, Mexico. Mr. Derrom, a member of the American Society of Mechanical Engineers, will be in charge of manufacturing and engineering.

FRED E. SMITH recently retired after serving as superintendent of the Northwestern States Portland Cement Company at Mason City, Iowa, for 48 years. He was succeeded by W. H. PATTERSON, who was previously plant supervisor. Mr. Smith went to Mason City in 1906 to become superintendent while the plant was under construction.

obituaries

LOUIS L. HOLM, 65, branch manager of the North Milwaukee Lime & Cement Company, Milwaukee, Wis., died unexpectedly on December 1. He had been associated with the concern for 43 years, the last 28 at the post which he held until his death.

JOHN W. MAGNUSON, 77, founder of the Western Feldspar Milling Company and M. & S., Inc., a mining firm, died recently in his home at Denver, Colo. He was a member of the Colorado Mining Association, and was well known for his work in developing and promoting the use of nonmetallic minerals.

BLAIR S. KEYES, 69, Carlsbad, Calif., died recently in his home. Before his retirement four years ago, Mr. Keyes had been sales manager for the Lehigh Portland Cement Company at Chicago.

FRANK W. MAIN, 75, a director of the Duquesne Slag Products Company, died recently at his home in Ventnor, N. J.

LLOYD D. YOUNT, 39, who operated the Yount Lime Company, Roseburg, Oreg., died on November 25, 1954, in that city. He had owned the business since 1944, when he went to Roseburg.

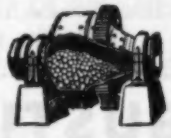
LUTHER C. ZOLLINGER, 70, retired vice-president of Dravo Corporation, died recently at his home in Pittsburgh, Pa. Mr. Zollinger's long association with Dravo began when he graduated from Lehigh University in 1909 and continued through a chain of executive positions until he retired last October as vice-president of Dravo-Doyle Company, a subsidiary of Dravo Corp.

JOE LUKCSO, chairman of the board of the Joe Lukcso Sand and Gravel Company and president of a firm handling materials which bore his name, died recently in a Cleveland hospital after an illness of a week's duration. He was 80 years old. Until recently he had been active in the affairs of these two firms and also a coal and supply concern. He founded a one-truck hauling business in 1920, using his home as its headquarters. In 1946 he and members of his family founded the sand-and-gravel concern, and subsequently branched out into the materials and coal businesses.

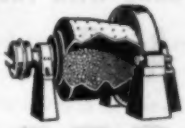
EARL C. HUEBNER, 64, treasurer and traffic manager of the Marblehead Lime Company, Chicago, Ill., died on November 19, 1954, at his home in that city. He had been associated with the firm for 33 years.

CHARLES A. ERNSTBERGER SR., who was a district sales manager for the Keystone Portland Cement Company of New York, died recently in a Montclair, N.J., nursing home after a long illness. He was 68 years old.

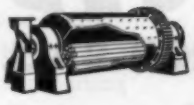
For ACCURATE Grinding Control . . .



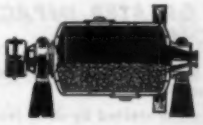
. . . Conical Mills



. . . Tricone Mills



. . . Rod Mills



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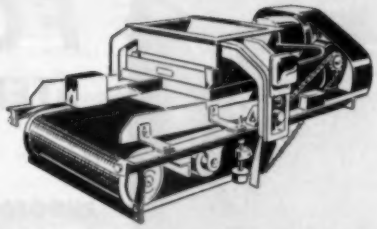
. . . Use the ELECTRIC EAR® . . .

An electronic grinding mill feed control which increases mill capacity 8 to 20%. Bulletin 42-8.

. . . in combination with the CONSTANT-WEIGHT FEEDER



A regulating feeder which maintains a positive constant-weight feed rate regardless of feed size of volumetric variation. Bulletin 33-D-8.

HARDINGE COMPANY, INCORPORATED

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legal decisions

By LEO T. PARKER
Attorney at Law
Cincinnati, Ohio

Contractor-Seller Breached Contract

Recently a reader asked this question: "If a contractor sells a ready-made structure and agrees to assemble it, what are the rights of the purchaser in event the contractor breaches his contract?"

An important point of law is that ordinarily a purchaser who rescinds a contract and delivers the unsatisfactory merchandise back to the seller cannot sue the seller and recover damages. However, according to a new higher court decision, if the purchaser attempts to use the subject of the sale and afterward discovers that the seller breached his contract, he may recover damages.

Stating this new law in a different way: the law is as follows: Generally, a purchaser who elects to rescind a contract cannot recover damages for the breach. However, if the contract contemplates the furnishing of merchandise or material for a particular purpose and the purchaser expends time or money in attempting to use it, but later rescinds the contract because the merchandise fails to comply with the terms of the contract, the purchaser is entitled to a recovery of not only the money he has paid under the contract, but also the reasonable expense he was put to in an attempt to use the material and subject of sale for the contemplated purpose.

For illustration, in *Miller Equipment Company, v. Gibson Company,* 56 N. W. (2d) 25, the testimony showed that a purchaser signed a sale contract with one Hopkins for the erection of a structure which was to have a slab or floor. The purchaser paid Hopkins $2,743 for the installation of the concrete slab.

After the concrete slab had been in use for some time, the purchaser for a good reason elected to rescind the contract. The higher court held:

"A purchaser who has rightfully rescinded such a contract may demand the complete restoration of the *status quo*, which includes the return of any expenditure made by him which was contemplated by the contract. The defendant (purchaser) is entitled to recover $2,743 with interest."

Also, this court held that a purchaser may recover additional damages for any and all expenses, loss of time, and the like which resulted from the seller's breach of a valid contract.

For comparison see *Lake v. Western Silo Company,* 158 N. W. 673. Here the purchaser of a silo rescinded, and he was permitted by the court to recover the expense of erecting it.

In addition, the court held that the seller must pay the purchaser adequate damages because the concrete silo did not meet the guarantee given by the seller.

$57,000 Damages

Last month a higher court held a concrete subcontractor liable for $57,000 damages for his failure to fulfill the terms of a contract made with a general contractor.

In *Gardner v. Ferguson,* 272 Pac. (2d) 99, these facts were shown by the testimony: One Gardner, a general contractor, had a contract to construct a school. This contract required him to furnish 2,450 cu. yd. of specially designed concrete. This portion of the contract was subcontracted to one Ferguson, who agreed to mix, prepare, furnish, and deliver at the job site all of the concrete called for by the main contract. The subcontract provided for a price of $15.50 per cu. yd., based on an estimate of 6 sacks of cement per cubic yard, with adjustments upward or downward dependent upon whether more or less cement was required.

Ferguson started performance under the contract and supplied 374.75 cu. yd. of concrete, but then breached the contract and refused to supply more concrete. Gardner secured the balance of the concrete from another subcontractor, who furnished 2,075.25 cu. yd. of concrete, which cost him $43.02 per cu. yd.

In subsequent litigation, the higher court held Ferguson liable to Gardner for $57,110 damages. This court said: "Damages were awarded to Gardner based on the difference between $15.50 per cu. yd., the price

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STEEL DROP BALL

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The "Cape Ann" Forged Steel Drop Ball is standard equipment in up-to-date quarries.

It has a forged connecting link, protected by deep recess, adaptable for swivel or shackle. Strong alloy steel pin. Low cable replacements. Furnished complete as shown.

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INTERNATIONAL DROTT 4-in-1 Skid Shovel

BULLDOZER—The bullclam is wide open and the rear of the bucket becomes the dozer. Depth of cut is regulated by forward and backward pitch of the blade.

BULLCLAM—By opening the clam 10 inches the cutting edge is lowered 2 inches. As the unit moves forward material boils into the bullclam.

SKID-SHOVEL—With clam closed, straight-forward loading of the shovel is accomplished by rolling the whole bucket forward to excavate. When filled it is rolled back over the Skid-Shoes to retain heaped load.

CLAMSHELL—Opening bullclam wide makes it possible to operate as a clamshell. Clam is brought down into material and closed by hydraulic pressure.

Hydraulic Selector Lever Converts Latest Addition to INTERNATIONAL DROTT line into a...

❶ BULLDOZER ❷ BULLCLAM

❸ SKID-SHOVEL ❹ CLAMSHELL

Here's the unit that answers every requirement for a single machine capable of handling a wide variety of jobs.

It's the NEW 4-in-1 multipurpose addition to the famed INTERNATIONAL DROTT Skid-Shovel line and it's available on INTERNATIONAL TD-6 and TD-9 crawlers.

The 4-in-1 can immediately be changed into a Bulldozer, Bullclam, Skid-Shovel or Clamshell by merely shifting the "shovel-selector" lever into the desired position. The lever is at the operator's finger tips, and shovel selection can be made whether the tractor is in motion or standing still. For fast loading of any material, the 4-in-1 can be operated either as a forward dump or bottom dump shovel.

Like all products in the INTERNATIONAL DROTT line, the new 4-in-1 reduces wear and strain on the tractor by transporting heaped loads on the exclusive Skid-Shoes. These same Skid-Shoes provide 300% greater break-out force than on competing shovels. There's the exclusive "Hydro-Spring" feature, too, that absorbs 70% of the shock normally encountered in front-end loaders for increased operator comfort and longer tractor life.

On specific earthmoving work such as excavating or loading the standard INTERNATIONAL DROTT Skid-Shovel is tops. But if you're looking for one machine to handle many jobs, the 4-in-1 is it.

For a demonstration, call your INTERNATIONAL Industrial Distributor today.

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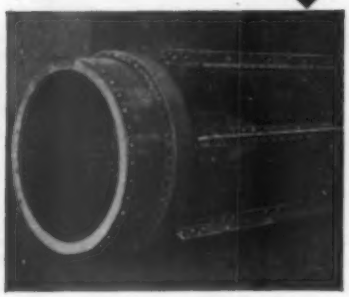

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Accurately cut and drilled from U.S. Steel Abrasion Resisting plate to fit your exact job requirements. All thicknesses from 3/16". Other dimensions as big as your needs. Holes taper-drilled, unless straight sides requested. Hole sizes ¼" diameter or larger. Any hole spacing from one diameter or greater.

All YUBA screens are cut square to close limits and rolled true to insure proper fit and fast installation. Quick delivery from ARS plate in stock. Competitively priced. Sketches submitted for your approval on request.

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YUBA DREDGES — PROVED DEPENDABILITY

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at which Ferguson had agreed to furnish the concrete, and $43.02 per cu. yd., the cost to Gardner of the balance of the concrete."

Contractor Is Favored

A reader asked this question: "If a property owner refuses to pay a contractor's bill on the grounds that the amount of the bill is excessive, what is the contractor's legal procedure?"

Recently a higher court decided this question and held that the contractor should file a mechanic's lien against the property. This court also approved a decision by the commission that the contractor's bill was reasonable, and not excessive.

For illustration, in *Whitehead v. Watts,* 254 S. W.(2d) 719, it was shown that a contractor filed a mechanic's lien against real property in the sum of $475.72. The property owner contended that the charges for the services were excessive, but the commission reviewed the testimony, decided that the amount of the contractor's bill was not excessive, and approved the validity of the lien.

The property owner appealed to the court, which reduced the judgment to $200, saying that this amount was sufficient payment for the contractor's work. The contractor appealed to the higher court, which reinstated the commission's verdict, saying:

"In the circumstances and under the evidence we think the lower court's action was arbitrary and unjust and, consequently, we reverse the judgment, and direct that a judgment be entered in conformity to the recommendation and report of the commissioner."

Estimate Precludes Accuracy

A reader asked this question: "If a contractor submits a bid to do work for an approximate price, is he expected by the law to keep his final price within his estimate?"

According to a higher court decision rendered last month, the answer is no. This is so because the use of the word "estimate" precludes accuracy. In other words, estimates are understood to be mere approximations.

For instance, in *Reeler v. Miller,* 254 S. W. (2d) 986, the court said:

"An estimate does not pretend to be based on absolute calculations but is exactly what the word means, and *estimate.* To make an estimate, ordinarily means 'to calculate roughly, or to form an opinion as to amount from imperfect data'."

City Rights Are Different

Generally speaking, if a contractor fails to fulfill the terms of his contract, the property owner can without any liability rescind the contract. However, a recent higher court held that this law is not applicable to a well drilled by a contractor for a city.

For instance, in *Village of Wells v. Layne-Minnesota Company,* 60 N. W. (2d) 621, it was shown that a city and a contractor signed a contract by the terms of which the latter agreed to drill a well capable of producing the minimum of 500 gallons of water per minute. After the well was completed to a depth of 670 ft., and capable of producing 500 g.p.m. of water, it was found that the well was not of sufficient straightness to permit the installation of a water pump beyond 350 ft., at which depth the well produced about 375 or 370 g.p.m.

Upon completion of the well the city paid the contractor $15,231, the contract price of the well. Thereafter the city sued the contractor to rescind the contract and to recover the $15,231 which it had paid, basing its right to rescission upon the breach of contract, as the well's straightness was defective.

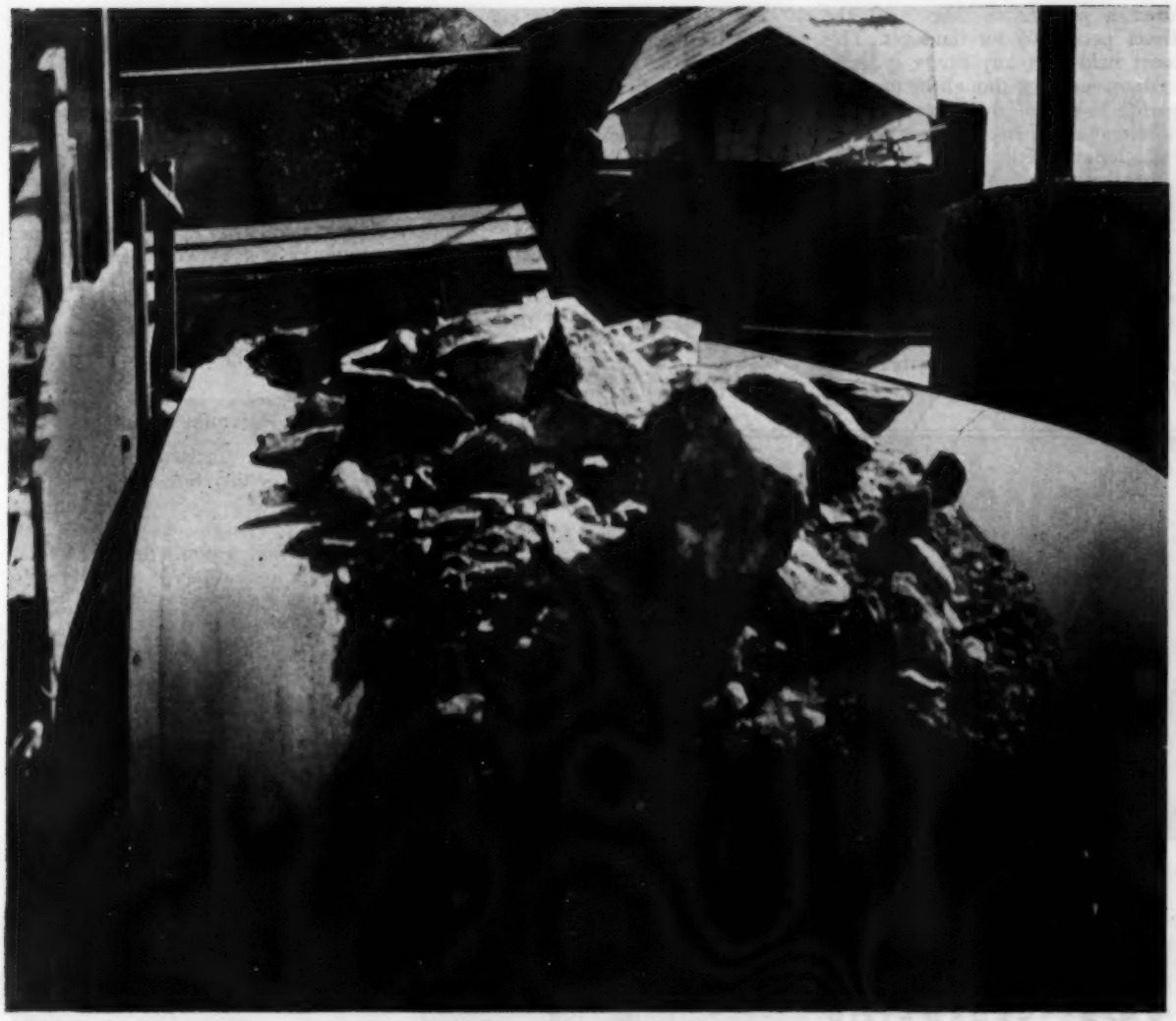
The lower court held the contractor liable in the sum of $18,069.74 damages, but the higher court reversed the verdict, holding that since the well was not absolutely worthless but was capable of continuously producing approximately 75 percent of the capacity of the well contracted for, the city, because of the physical impossibility of making restitution, could not rescind the contract.

Driver Is Personally Liable

The proprietor of a concrete block plant wrote as follows: "Some time ago I think I read in your column in Pit & Quarry that a hired driver of a motor truck can be compelled by the courts to pay damages to a person he injured while driving his employer's truck. Is this so? Does this relieve the employer from damage liability?"

The higher courts consistently hold that while an employer is liable for negligent injuries caused by his employee, the employee himself is personally liable to the injured person. This is important law, because if operators of nonmetallic minerals plants inform employees of their personal responsibilities for injuries caused by their negligence, there is no question but that this knowledge will induce them to use a higher degree of care to prevent injuries to persons and property.

For example, in a leading case (218 N.Y.S. 536) the testimony proved that a driver negligently in-



New Conveyor Belt Combines Increased Strength With Extra Flexibility

Rugged Mainliner - Conveyking conveyor belt is engineered for tough jobs involving high tensions, high lifts and long center distances. It's ideal for conveying aggregates, coal and ores. It's steel-like in strength, practically stretchless, yet extremely flexible and troughs easily.

Mainliner belts have about twice the strength of ordinary cotton duck belts of the same gauge. They resist the destructive action of water, oil, weather and age. Why? Because these belts are made of multiple plies of strong duck with Nylon woven across the width and a new-process, high-strength cotton woven lengthwise, with skim coats between plies. They are available in any lengths, with any number of plies, in widths up to 72″.

Like other heavy duty belts, these Mainliner Conveyking belts are custom made to meet particular requirements of individual jobs. They can be made with a cover tensile strength of 3500 to 4000 pounds average and a friction pull of 20 to 24 pounds average. They can also be made with a cover tensile strength of 2500 to 3000 pounds and a friction pull of 16 to 19 pounds. They are also available in oil-resistant Neoprene. All are mildew inhibited throughout. A breaker strip can be included in top cover, if specified.

We also manufacture a complete line of industrial rubber products: hose, belting, packing and moulded rubber of every construction for every need. *Through your Quaker and Quaker Pioneer distributor* our research and engineering services are always available to help you solve any industrial rubber problem. *Write for free folder and name of distributor.*

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jured a pedestrian, who sued the driver personally for damages. This court held that any driver is liable in damages, even though he may not be the owner of the motor vehicle, if he operates it in a careless manner and causes an injury.

In another case (217 N.Y.S. 261) the testimony showed that the hired driver of a motor vehicle negligently collided with an automobile, seriously injuring its occupants. This driver was held liable in a large sum of money for the injuries he caused.

The latest higher court decision involving liability of a driver is that in *Reinmueller v. Chicago,* 95 N. E. (2d) 120. Here the higher court held a negligent driver liable in $22,500 damages, and said:

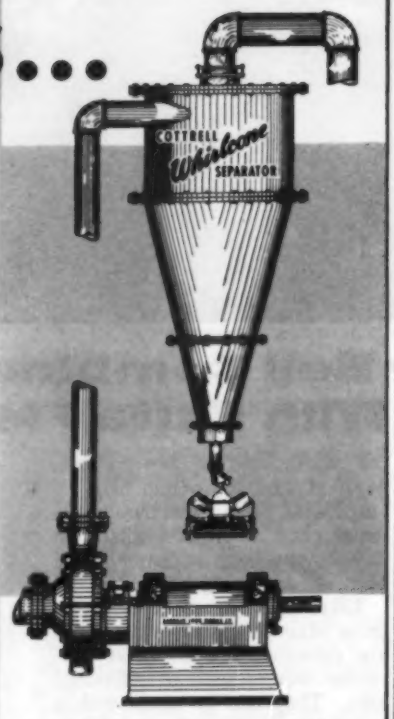
"The injuries here were undisputed; they were of such nature as to leave no room for dispute. This 68 year old woman's leg was severed, the bone was crushed, and there was nothing left of the soft part except the enveloping skin. . . . Defendant Schrubbe (driver) testified that he did not at any time see the woman prior to the accident."

Also, this court held that a jury may award unusually heavy damages because of decreased value of the American dollar. In this respect, the higher court made the statement:

"The jury were entitled to consider the pain and suffering undergone, the disfigurement and mutilation, as well as the decreased purchasing power of the American dollar."

Nevertheless, the fact that a hired driver of a motor vehicle is held personally liable for his negligence, the employer is not relieved from liability. In some instances the courts hold both the employer and driver jointly liable and in other decisions the employer and employee are held separately liable.

Now You Can Recover Your Fines With This...



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Whirlcone
SEPARATOR
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Thousands of tons of valuable sand in the minus 50 mesh range are lost with wash water in Sand Plants all over the world. The well-known Cottrell Whirlcone Separator will save this sand at small cost.

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DIVISION OF
GIW
GEORGIA IRON WORKS CO.
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The Whirlcone will de-slime and de-water these fines with approximately 95% efficiency in the plus 200 mesh range. There is a GIW Slurry Pump and a Cottrell Whirlcone Separator combination to fit any plant flow sheet. If you are losing fines, let us have your inquiry giving approximately the volume of flow and the nature of the losses. Our recommendations and literature will follow.

Nuisance Issue

Recently a quarry operator asked me whether the courts will stop the operations of a quarry which annoys owners of nearby dwellings. Last month a higher court held that generally the operations of a quarry will not be completely stopped on complaints of owners of nearby homes, but that the court can limit the uses of the quarry.

For illustration, in *Mortan v. Superior Court of State, in and for San Mateo County,* 269 Pac. (2d) 83, the testimony showed facts, as follows: A quarry is located in unincorporated territory about one mile from the city limits of Redwood City, and is operated by the Whipple Road Quarry Company. It has been operating at its present site since 1929. The evidence showed that there are about 55 homes within a half-mile of the boundaries of the quarry property.

A suit was filed by owners of dwellings to stop the operation of the quarry on the grounds that it is a nuisance; that it caused an excessive amount of dust; and that the rock crusher, the trucks, and the tractors used in the quarry operation created a great amount of noise which annoys some of the householders. There was evidence that the quarry sometimes operated on Sunday, and that on some days it started operations early in the morning.

The lower court issued the injunction, but the higher court reversed this decision, saying:

"The operation of a quarry is, of course, a lawful business. It is not a nuisance *per se.* Of course, if in fact it is being operated so as to constitute a nuisance, the acts constituting the nuisance may and should be enjoined. Frequent sprinkling of the shoulders of the quarry road would obviously curtail dust from that source. The traffic hazard could be controlled by the use of a flagman at the intersection of the quarry and

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over 1000 in successful use all over the world. for installations up to 200 tons per hour.

- **Rock lumps of one cu. yard reduced to 0-1¼" in one operation.**
- **Extra high percentage of fines in a single passage.**
- **Final product in consistent cubical shape.**
- **Instantaneous regulation to fraction desired.**
- **Highest immunity to foreign bodies.**
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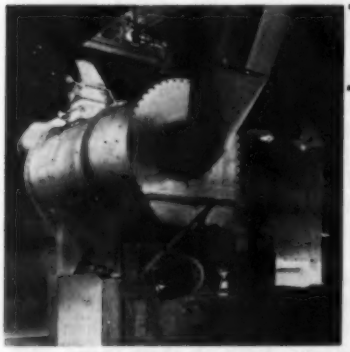
Used for primary crushing of limestone on the raw side and also on the cement side for clinker.



Used for drying the crushed limestone, and also widely employed for drying coal.

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Rapid Dryer installation (System Andreas) for slag-sand drying at a cement plant.

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Edgewood roads. Obviously, Sunday or early morning or late evening operations could be regulated."

This court went on to say that rock must be quarried at the site where it exists, or not at all. An absolute prohibition, therefore, practically amounts to taking the property since it denies the owner the right to engage in the only business for which the land is fitted. An injunction should be employed only when no other means of protecting the complaining public exists.

For comparison, see *People v. Hawley,* 279 Pac. 136. Here it appeared that smoke, dust, and noise emanated from a quarry and that stagnant water accumulated there, to the annoyance and damage of some of the surrounding property owners. Excavations made by the quarry company endangered the adjacent properties by increasing the danger of floods. The lower court issued an injunction to stop the operations of the quarry. The higher court reversed the decision on the grounds that absolute prohibition was not justified and told the owner to reduce the annoyances.

Blasting Liability

Several readers with whom I talked last summer asked legal questions relative to conditions under which a property owner can collect damages from a company which does blasting.

Last month a higher court rendered an important decision in a suit filed by a mink ranch owner who lost numerous mink kittens caused by blasting operations. I shall review this new decision.

All late higher court decisions generally hold that the doctrine of absolute liability of a company for damage caused by blasting should apply if the damage from blasting is caused by concussion, vibration, or jarring, not by the casting of rocks and debris. See *Patrick,* 134 Pac. 1076. In this case the court held that contractors who set off an exceedingly large blast of explosives, causing the earth for a considerable distance to shake violently, were liable to an adjoining owner whose property was damaged and whose water supply was lost, without regard to negligence in setting off the blast, although there was no physical invasion of the property.

Hence, this law is established: One who carries on an "ultrahazardous" activity may be liable to another whose person, land, or chattels are harmed. Thus, if a property owner suffers financial loss by blasting or other operations which are ultrahazardous, he may recover damages if he proves that the blasting operations actually caused damage.

For example, it cannot be said always that a person or company must bear responsibility for every harm that it may cause. If a suit against one who does blasting is based on the plea of ultrahazardous activities, the property owner must prove this allegation. Otherwise he will lose the suit.

In other words, modern higher courts consistently hold that a property owner cannot win a damage suit based on financial losses caused by another's blasting operations, unless he proves that such operations resulted from negligence, or at least the fault of the party who did the blasting. So held a higher court in the case of *Foster v. Preston, Company,* 268 Pac. (2d) 645, decided only last month.

The testimony in this case disclosed these facts: A man named Foster operates a mink ranch located in a rural area. The ranch is located about two blocks from U. S. highway No. 10, which is a main east-west thoroughfare across the state. Northern Pacific Railway Company tracks are located on the other side of the highway about 1,500 ft. from the ranch. This explanation is necessary to show that actually the mink ranch is in an area subject to certain noises.

The period of each year during which mink kittens are born, known as the whelping season, begins about May 1. During this period, the mothers are very excitable. If disturbed by excessive noises, they run back and forth in their cages and frequently destroy their young, but mink become accustomed to some noises. This explains why the mink on this ranch were apparently not bothered, even during the whelping season, by the heavy traffic on U.S. highway No. 10, and by the noise and vibration of passing trains.

The ranch owner sued the company which was performing blasting operations. During the trial the manager of the ranch testified that the blasting resulted in vibration which would rattle on the cages. The mother mink would then run back and forth in their cages, and many of them would kill their kittens. Peterson also testified that on two occasions the blasts had broken windows.

To offset this testimony the company had a university professor testify as to tests made with a pin seis-

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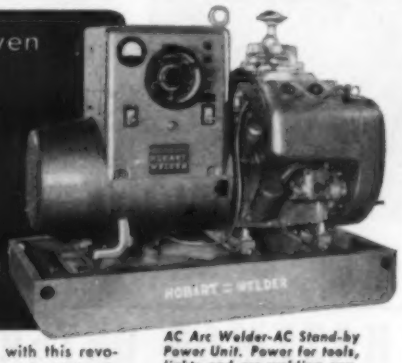

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mometer with blasts as large as those used by the company. He testified that the blasting operations could not have caused the damaged alleged by the ranch owner.

Also, officials of the company testified that it would have been impractical to cease blasting operations entirely without discontinuing its business operations.

After listening to all testimony the higher court refused to hold the company liable in damages to the ranch owner. This court said:

"Is the risk that any unusual vibration or noise may cause wild animals, which are being raised for commercial purposes, to kill their young, one of the things which make the activity of blasting ultrahazardous? The decided cases indicate that the thing which makes blasting ultrahazardous is the risk that property or persons may be damaged or injured by coming into direct *contact with flying debris,* or by being directly affected by vibrations of the earth or concussions of the air."

The court stated further: "The relatively moderate vibration and noise which appellant's (company's) blasting produced at a distance of two and a quarter miles was no more than a usual incident of the ordinary life of the community."

Liable on Implied Contract

Discussion has arisen frequently over the legal question: If a contract fails to specify the details of construction, who is responsible for defective work, the contractor or the property owner?

Last month a higher court held that the contractor is responsible. This court held that a construction contract includes not only what is expressly stated but also what is necessarily to be implied from the language used. In other words, in the absence of an express provision, the law will imply an agreement by the contractor to perform those things that according to reason and justice he should do in order to carry out the purpose for which the contract was made.

Also, this higher court held that if a general contractor makes a contract with a property owner, and a subcontractor does the work improperly, the general contractor is solely liable to the property owner.

For illustration, in *Cox v. Curnutt,* 271 Pac. (2d) 342, the testimony showed facts, as follows: A property owner named Curnutt entered into a written contract with F. A. Cox for certain repairs on a residence and for the construction of a concrete driveway. Cox secured the services of George H. Smith in the construction of the concrete work. There was no written warranty as to the work, but as usual there was an implied warranty as to fitness and good workmanship. Curnutt alleged that the concrete work was carelessly, negligently, and improperly performed, that shortly after its completion cracks developed in the driveway, and that the necessary cost and expense of repairing and reconstructing the driveway would be $1,000. Curnutt sued both Cox and Smith for this amount.

During the trial two expert witnesses testified that there was nothing wrong with the concrete as to its thickness and strength; that the cracks in the concrete driveway probably resulted from lack of sufficient expansion joints or failure to use wire mesh or reinforcing steel in laying the conglomerate, or the failure to use a sand base below the concrete slab.

In order to contradict this testimony Cox and two independent concrete contractors testified that the expansion joints were placed approximately 20 to 25 ft. apart as provided by the Building Code, the customary practice employed by cement contractors; that steel reinforcing or wire mesh and a sand base were not used in concrete work in residence driveways unless specified in the contract; and that the use of reinforcing material or a sand base would not prevent cracks.

The higher court listened to all this testimony and rendered its verdict, as follows: Smith could not be liable to Curnutt because the latter's contract was made with Cox. However, Cox is liable in damages to Curnutt because, although in the contract Cox did not guarantee the driveway, yet there was an implied warranty of fitness in the construction and an implied stipulation requiring a workmanlike job in the construction of the driveway.

In holding Cox liable in full damages to Curnutt, the court said: "There is proof that the soil upon the driveway in question consisted of clay base or gumbo formation, and that such soil, whether wet or dry, would cause expansions and a movement of concrete thereon. Where a contract does not provide to the contrary, the contractor must decide whether materials, plans, and specifications will provide good workmanship at his peril, and is liable to the

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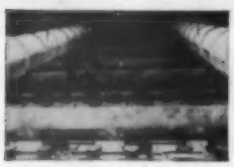

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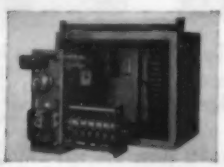

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owner if intended result is not produced."

Read Your Insurance Policies

Several months ago the writer published, in these pages, the cause and outcome of several outstanding law suits in which companies whose officials believed they had adequate insurance actually had no insurance protection at all. Since that time I have received numerous requests from readers to keep them informed of new higher court decisions involving unusual insurance law suits. Recently I located other higher court decisions on this subject which will interest readers.

According to a leading higher court decision a company which keeps records where they can be destroyed or stolen, violates insurance policies and therefore forfeits the right to collect insurance, in case of a loss.

For illustration, in *Ever Company v. New Amsterdam,* 61 N. W. (2d) 172, it was shown that a company held a burglary insurance policy which provided, as is usual in such policies, that the insured would keep records in such manner that the insurance company could accurately determine the amount of a loss which might be incurred.

The testimony showed that the company kept money in envelopes in its safe, notations on the envelopes indicating the amount of money in each one.

One day unknown persons forcibly entered the plant and office, broke open two safes and abstracted the money. At the time of the burglary the above mentioned insurance policy issued to the company was in force and effect, providing for the indemnification of the assured for the loss of money and securities caused by wrongful abstraction, burglary, or robbery within the premises.

In subsequent litigation the higher court held that these notations on the envelopes did not constitute a proper "record" within the burglary policy. The court said:

"Plaintiff (company) should have anticipated that if the money was wrongfully abstracted from the safe, the envelopes containing it would likewise be taken, so that no record would remain."

This court also explained that an insured does not comply with the requirements of any insurance policy, unless it keeps records and books in such a location where they will not be likely to be destroyed by fire or theft. In other words, the purpose of the "record" clause in the usual

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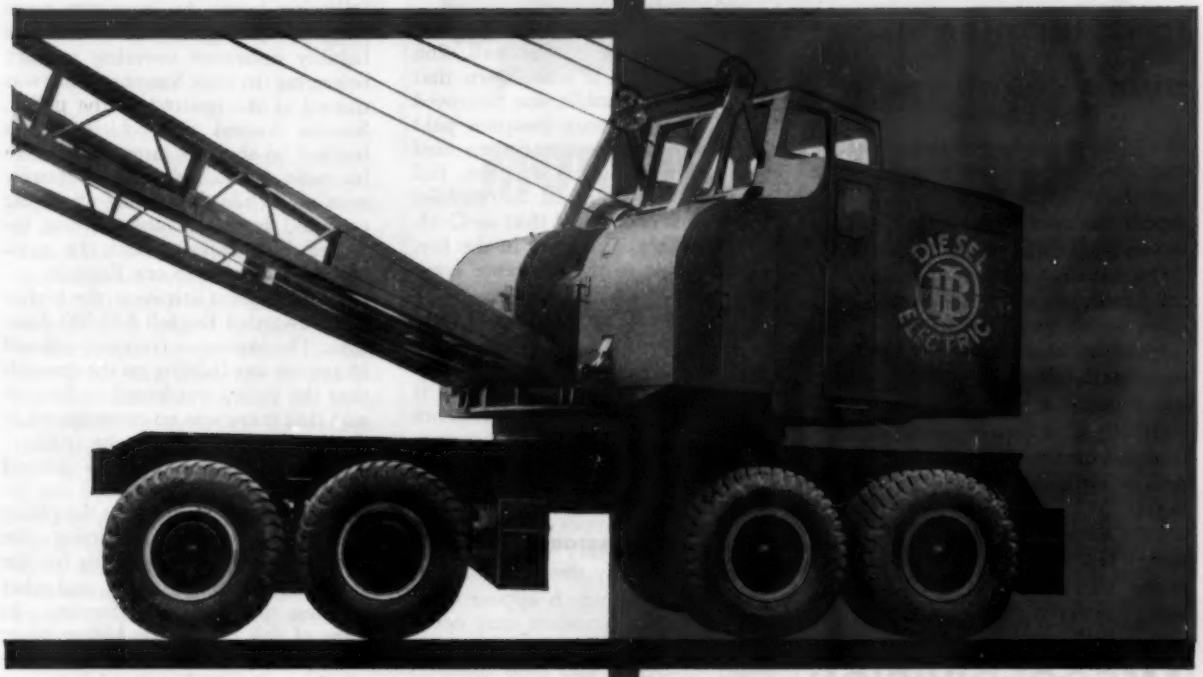

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insurance policy is to enable the insurance company to verify a loss alleged by the insured. An insured which violates this clause thereby automatically invalidates the policy and forfeits all his normal rights to collect a loss from the insurance company.

Recently a higher court held that any person whose negligence causes a loss paid by an insurance company must repay the loss to the insurance company. In this case an automobile was a total loss by fire, and the insurance company paid full value of the automobile to its owner. The court held that the insurance company can sue and recover this full amount from one whose negligence caused the fire.

For illustration, in *Motors Insurance Corporation v. Caldwell,* 266 S. W. (2d) 321, it was shown that an insured automobile was destroyed by fire. The insurance company paid the loss to the owner and then sued one Caldwell for $780, the full value of the destroyed automobile. The higher court held that as Caldwell's negligence resulted in the fire, he was liable to the insurance company, saying:

"The evidence supported an award of damages for destruction of an automobile by fire on the theory that it was so badly damaged that it could not be repaired, and hence was a total loss when the automobile was sold to a salvage company for use in repairing other damaged vehicles."

Must Notify Insurance Company

Very frequently the higher courts render decisions which appear to be unfair. Such a situation may occur when, for instance, a motor vehicle owner insures it and then transfers ownership to a close relative without giving the insurance company any notification.

For example, in *Bettinger v. Northwestern Company,* 213 Fed. Rep. (2d) 200, the testimony proved these facts: A motor truck liability insurance policy was issued to one Bettinger. Without notifying the insurance company, Bettinger transferred ownership to the truck to his son, who later, while driving the vehicle, had a bad accident.

The higher court held Bettinger personally liable in heavy damages to persons injured in the accident but at the same time refused to hold the insurance company liable on the policy.

Also, see *Wills v. White,* 267 S. W. (2d) 17. This higher court refused to pay insurance on a motor vehicle owned and operated by a sand and gravel company because the stenographer employed by the insurance company to write the policy had inadvertently copied the serial number of the truck No. E68,972, when the correct number was E67,972.

Insurance Company Held Liable

It is most important when officials and owners of motor vehicles apply for automobile liability insurance that they should be certain to insist on the inclusion of a broad clause in the insurance policy which will give adequate protection while the vehicle is being used by any one with permission of the insured.

For example, in *English v. Virginia Surety Company,* 268 S. W. (2d) 338, the testimony showed the following facts: An insurance company issued a policy of automobile liability insurance covering a truck belonging to one Stevens, who was named as the insured in the policy. Stevens loaned the vehicle to his brother, so that the latter might take his wife and children to a family reunion. While the vehicle was being operated by the brother, it was involved in a collision with an automobile belonging to one English.

In subsequent litigation, the higher court awarded English $10,500 damages. The insurance company refused to assume any liability on the grounds that the policy was issued to Stevens and that there was no coverage while the brother was driving the truck.

During the trial Stevens proved that at the time he applied for insurance, he demanded that the policy contain a clause permitting the truck to be used occasionally for the "personal, pleasure, family, and other business purposes" of Stevens. In view of this clause, the higher court held the insurance company liable on the policy and ordered it to pay the $10,500 damage allowance. The court said: "Marvin B. Stevens, (brother) driving the W. D. Stevens vehicle with permission of the named insured, was an additional insured at the time of the accident and therefore covered by the provision of the policy in question."

Ordinance Is Valid

A few days ago I recived a letter from a dealer in machinery used for excavations, crushing rock, etc., containing this query: "Is a state, county, or city law valid which requires me to conduct my business inside a closed lot or building?" A few weeks ago a higher court answered this question in the affirmative.

See *People v. Sevel,* 261 Pac. (2d) 359. Here a county ordinance was litigated which provides that it is

unlawful to maintain a "junk yard" in the county unless it is maintained within an enclosed building or upon a lot enclosed by a solid fence at least 6 ft. high.

The higher court held the ordinance valid and enforceable, saying: "We find nothing which violates the defendant's constitutional right to conduct his lawful business. Such regulation is but a reasonable restraint in the interest of the public safety and general welfare."

Manufacturer Is Materialman

Here is another situation frequently involved in a lawsuit: If a manufacturer or seller of nonmetallic materials or equipment installs them, is he a subcontractor or a materialman? The answer to this question is important when filing a mechanic's lien.

For example, in *Rabisso, Inc. v. Frick,* 108 N. E. (2d) 282, the testimony showed these facts: A property owner employed a general contractor to build a house on a cost-plus basis. The general contractor made a contract with a subcontractor to install the sewage disposal at a specified contract price. The subcontractor purchased from a manufacturer a septic tank which the manufacturer trucked to the site where the subcontractor had made an excavation for the tank. He lowered the three sections of the tank into the excavation and cemented the sections together. In subsequent litigation, the higher court said:

"The manufacturer who made the septic tank and who lowered the three sections of the tank into the excavation and cemented the sections together, was a 'materialman' and not a 'subcontractor'."

Work on Fire Safety Codes Available in Six Volumes

National Fire Codes, a compilation of 162 fire safety standards as developed by the National Fire Protection Association, has recently been published in a new six-volume edition.

The subjects covered are as follows: Vol. I, flammable liquids and gases; Vol. II, combustible solids, dusts, chemicals, and explosives; Vol. III, building construction and equipment; Vol. IV, extinguishing equipment; Vol. V, electrical standards; and Vol. VI, transportation standards.

The book may be obtained at $6 per copy by writing to Publications Department, National Fire Protection Association, 60 Batterymarch Street, Boston, Mass.

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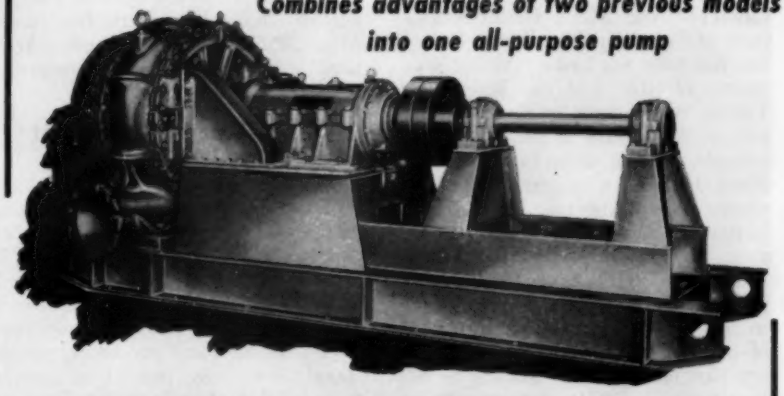

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Black Hills Atlas—Vol. I Released by Mines Bureau

All available information on known mines and mineral deposits in South Dakota's Black Hills will be summarized in a comprehensive mineral atlas being prepared by the Bureau of Mines. The first volume of the two-part report, covering Lawrence and Mead Counties and parts of Butte and Pennington Counties, has been released by Acting Secretary of the Interior Ralph A. Tudor. When completed, the report will make possible a general determination of the potentialities of the Black Hills as a mineral-producing region. It will also provide basic information for detailed study of a given property or commodity.

The Black Hills cover an area approximately 100 miles long and up to 50 miles wide in the western part of South Dakota and the northeastern part of Wyoming. Mining in the area began in 1874, when a military expedition under General Custer found a placer deposit of gold. Limestone, sandstone, gypsum, bentonite, and cement contribute substantially to the mineral production of the area.

The report discusses the history, production, and geology of the Black Hills; indexes mines and mineral properties alphabetically, numerically, and by commodities; and gives brief but detailed descriptions of each property.

A copy of I. C. 7688, *Black Hills Mineral Atlas, South Dakota, Part I,* can be obtained from the Bureau of Mines, Publications Distribution Section, 4800 Forbes Street, Pittsburgh 13, Pa.

1953 Phosphate Rock Output Tops 40,000,000-Ton Mark

Mine production of phosphate rock ore in 1953 totaled more than 40,000,000 long tons, according to reports by producers to the U.S. Bureau of Mines. The total United States marketable production rose 4 percent in 1953, with increases registered in all three producing areas. Total stocks in producers' hands were slightly less in 1953 than in 1952.

Phosphate rock sold or used by producers in the United States was more than 10 percent above the 1952 figure. The western states showed the largest increase, 59 percent, followed by Tennessee with 12 percent, and Florida with 4 percent.

Imports were 8 percent below 1952, whereas exports were 47 percent above 1952. The apparent domestic consumption again set a new record, rising more than 5 percent above 1952 and more than 119 percent above 1943.

Bulletin on Noise Problem Discusses Some Solutions

Facts On Factory Noise, a 40-page booklet recently issued by the Associated Industries of New York State, Inc., Albany, N.Y., summarizes important practical approaches to plant noise suppression. It contains some 20 examples of noise problems and their solutions, which were presented at the Factory Noise Control Conference sponsored by Associated Industries at the General Electric Research Laboratory, Schenectady, N.Y. More than 200 top-level executives of some 93 industrial concerns participated in the conference.

The major conclusion reached at the meeting is that noise can be controlled. These basic principles for noise control were cited in all the papers presented: (1) eliminate the source; (2) prevent the noise from escaping beyond the source; (3) reduce the level in working areas by sound absorption; (4) protect the exposed persons.

The booklet is priced at 75 cents per copy, or 50 cents per copy on orders over 100, and can be obtained by request to the Associated Industries of New York State, Inc., 1 Elk Street, Albany, N.Y.

Versatile Vermiculite Used To Cut Eelworm Damage

A new method of killing nematodes—commonly known as eelworms or threadworms—promises to help reduce the $400,000,000 to $500,000,000 plant damage caused by these pests each year. Experiments have found that costly liquid fumigants can be used in gardens and other farm lands if the fumigants are absorbed and carried in vermiculite.

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Shipments of Portland cement by Canadian manufacturers have increased steadily since World War II, reaching an alltime peak of 22,224,314 bbl. in 1953, which was 3,704,176 bbl. (20 percent) above the 1952 total and nearly three times the 1945 shipments.

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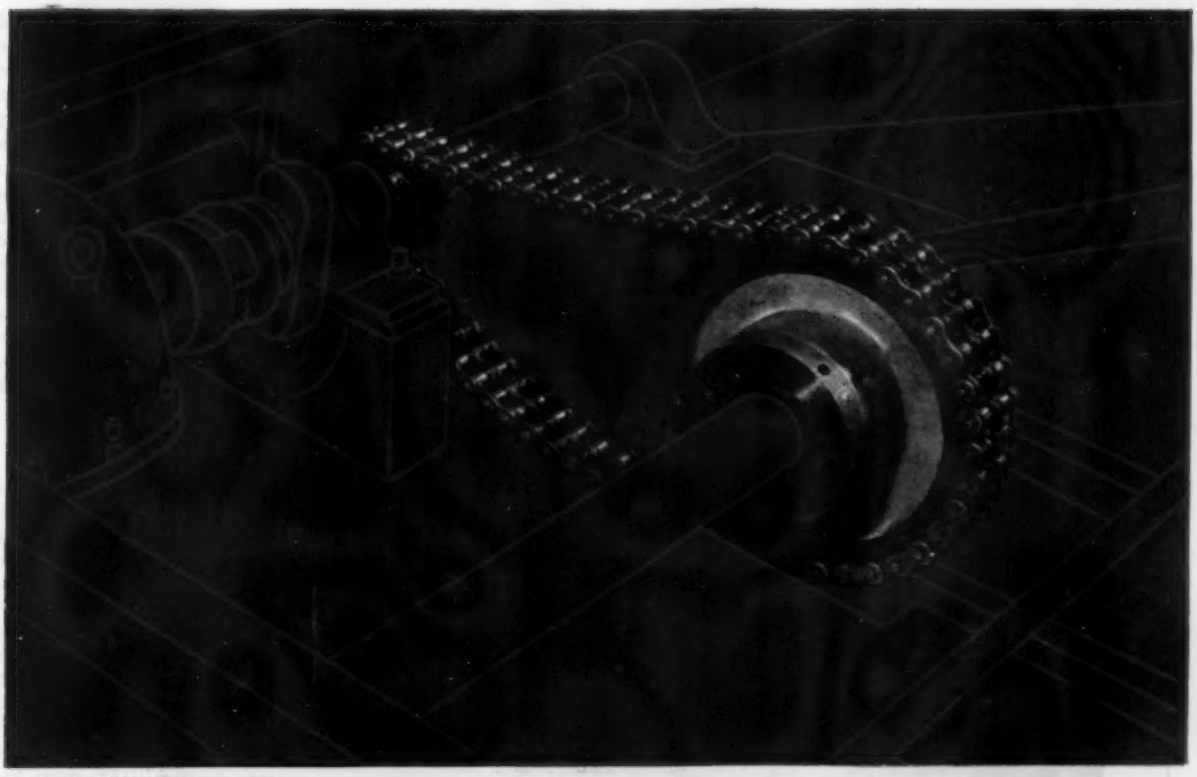

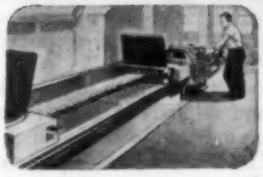

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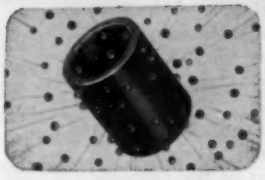

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(3) High efficiency — Positive action, independent of atmospheric conditions. No power loss through slippage or excessive bearing friction.

You can get complete information from 148-page Data Book 2457. It covers single and multiple width roller chain and sprockets in ¼″ through 3″ pitch, 1″ through 3″ double pitch. Ask your nearest Link-Belt office or authorized stock carrying distributor for a copy today.

LINK-BELT

ROLLER CHAIN & SPROCKETS

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.

RUGGED AND DEPENDABLE AT low cost

• Salem type buckets

• Continuous type buckets

• Super capacity type buckets

Standard high quality steel elevator buckets are available in all styles, types, sizes and gauges for replacement as well as new installations. For real economy and immediate service, get acquainted with the Standard line today.

The Standard Metal Mfg. Co. SINCE 1921

Write for new catalog showing the complete line of Standard buckets and prices.

STANDARD METAL MFG. CO.
111 Center St., Malinta, Ohio

Canadian Mineral Output Sets New All-Time High

Mineral production in Canada attained a new high value of C$1,331,000,000 in 1953. Cement was up nearly C$12,000,000, and iron ore about C$9,000,000. In contrast, the value of the output of zinc declined to C$34,000,000. The asbestos output was valued at C$87,600,000, marking a slight decline in both quantity and value from 1952. Barite output in 1953 was almost double the 1952 figure. Most of the other nonmetals, such as feldspar, fluorspar, mica, talc, and salt, showed only slight changes.

A new high was established for structural materials at C$183,000,000. Cement firms shipped 22,600,000 bbl., valued at C$39,800,000, in 1953. Producers of brick, tile, sewer pipe, and other clay concrete aggregates, etc., totaled C$50,800,000. Stone for buildings, railway ballast, highways, etc., was valued at C$430,300,000.

Potential Mica Supply Seen In Davy Crockett Lake Silt

An unexpected source for replenishing the nation's dwindling domestic reserves of mica may have been found in Davy Crockett Lake behind Nolichuckey Dam, Greeneville, Tenn.

According to Tennessee Valley Authority spokesmen, there is "a considerable amount of the valuable scrap mica in the silt that has accumulated there." TVA is said to be willing to permit recovery of the material on a royalty basis. That portion of Davy Crockett Lake offered for working is approximately 215 acres in area, and it is thought to contain about 4,500,000 tons of silt.

TVA scientists stated that the mica is present in the silt as the result of rock erosion upstream on the Nolichuckey River and feldspar and mica mining operations in North Carolina. The lake and Nolichuckey Dam were acquired by TVA from the East Tennessee Light and Power Company in 1945.

Virginia Highway Dept. Issues Exhaustive Aggregate Survey

Physical Test Results of the Virginia Highway Statewide Aggregate Survey, a new publication of the Virginia Department of Highways, tabulates tests on both coarse and fine aggregates which are the culmination of six years of field work.

The inventory was exhaustive, 2,250 samples of sand and gravel and various rock types having been collected from all parts of the state. Tests performed on the fine aggregates were on grain size, fineness modulus, absorption, specific gravity, and compressive strength. The coarse aggregates were tested for resistance to abrasion and to freezing and thawing, specific gravity, absorption, and affinity for bituminous material. This bulletin can be obtained from the Commonwealth of Virginia, Division of Purchase and Printing, Richmond, Va. Organizations are furnished the first copy free of charge; additional copies, $5 each.

Potash Production Continues To Show Strong Increase

The domestic production of marketable potassium salts again reached a new high in 1953, increasing more than 13 percent above the 1952 production, according to reports of producers to the U.S. Bureau of Mines. Sales and apparent consumption of potassium salts both increased in 1953, eight percent and four percent, respectively, as compared to 1952. Stocks in producers' hands at the end of 1953, more than double the 1952 figure, were 470,000 short tons with a K_2O content of 278,508 tons. Both imports and exports of potash materials were less in 1953.

The production of both high-grade muriate and sulphate of potash (including sulphate of potash magnesia) increased in 1953, 19 and 6 percent, respectively.

New Mexico, California, and Utah continued to supply the major portion of the domestic production, with New Mexico supplying 90 percent.

After a 48-hour work stoppage the Bunnell, Fla., plant of the Lehigh Portland Cement Company resumed operations when an agreement on a new wage contract was reached by officials of the company and the striking Cement, Lime and Gypsum Workers of America local Union. The new contract provides for a package increase of six cents an hour.

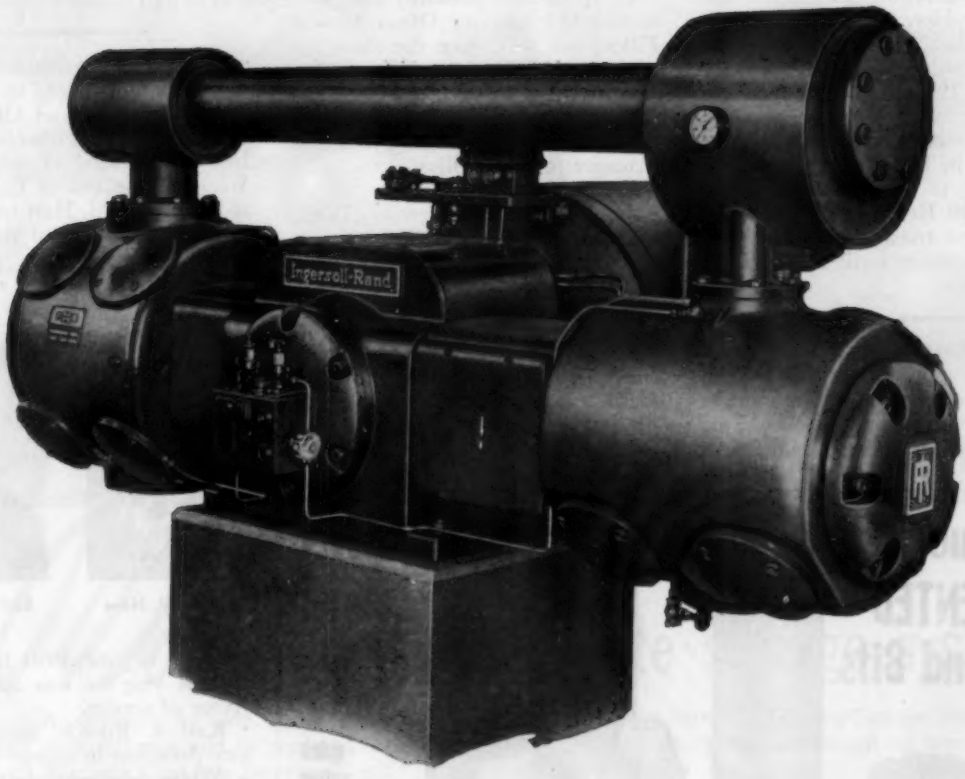
The following officers were elected during the recent convention of the Marble Institute of America held at the Edgewater Beach Hotel in Chicago: Milton S. Brown (T. H. Winston Company, Cincinnati), president; T. E. Taylor, (Carthage Marble Corporation, Carthage, Mo.,) vice-president; and Frank J. McCue (McCue Marble Company, Chicago), secretary.

NEW

OPPOSED-CYLINDER

BALANCED DESIGN, TYPE PHE

COMPRESSOR



COMPACT, SPACE-SAVING PACKAGED DESIGN

The new, space-saving PHE design marks another Ingersoll-Rand achievement in electric-driven compressors. Built for continuous, heavy-duty service, it includes the following outstanding features: Opposed pistons with excellent running balance — Efficient tube-type intercooler—New cylinders with Type A Channel Valves—Motor mounted directly on crankshaft—Full floating aluminum main and crank-pin bearings — Sealed crankcase — Force-feed lubrication.

FOR EASY SHIPMENT, INSTALLATION & RELOCATION

Shipped completely assembled and ready to run, the PHE compressor can be easily installed—in very little floor space—with a minimum of piping—and on a simple inexpensive foundation. Relocation, if required, is equally simple.

ELECTRIC-DRIVEN 75 AND 100 HP SIZES

The basic design is a two-stage unit for 80-125 psi. For other pressures, or for pumping vacuums, alternate cylinder arrangements can be supplied. It will pay you to get all the facts on this new, cost-saving design. Ask for Bulletin No. 3155.

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1-106 11 Broadway, New York 4, N. Y.

COMPRESSORS • AIR TOOLS • ROCK DRILLS • TURBO BLOWERS • CONDENSERS • CENTRIFUGAL PUMPS • DIESEL AND GAS ENGINES

trade notes

Byron S. Snowden has been appointed as director of advertising and merchandising-trucks, for the Dodge Division of Chrysler Corp., Detroit, Mich.

Mr. Snowden joined the Chrysler Corp., in 1945 as district manager for Dodge in the Boston region. He was appointed Dodge city manager in Boston in 1949, being transferred to Detroit to the truck promotion staff in 1950. He became merchandising manager-trucks, in 1953, serving in that capacity until his new appointment.

The following personnel changes in the areas of sales promotion and of public relations have been brought about by the merger of The Dorr Co., of Stamford, Conn., and Oliver United Filters of Oakland, Calif., under the name of Dorr-Oliver, Inc.

C. W. Crumb, presently sales promotion manager for Oliver United Filters will take over the same responsibilities for the joint corporation. C. M. Comstock, currently assistant advertising manager of Dorr, will become assistant sales promotion manager for Dorr-Oliver.

The Trabon Engineering Corp., Cleveland, Ohio, announces the appointment of R. E. Kunz Co., 408 Broad St., Seattle, Wash., as its distributor.

Rudolf Torbico, formerly with Moore-Wright Co., has joined the Carboloy Department of General Electric Co., Detroit, Mich., as a field sales representative.

The assets and business of the Globe Steel Tubes Co. of Milwaukee, Wis., have been purchased by The Babcock & Wilcox Co., N. Y., N. Y.

Terms of the transaction have been approved by the boards of directors of both companies and revealed that the selling price was approximately $9,300,000. Stockholders of the Globe Steel Tubes Co., will get cash for their holdings.

The Babcock & Wilcox Co., announced that it will continue to operate the Milwaukee plant as a part of its Tubular Products Division.

Two major organizational changes have been announced by The White Motor Co., Cleveland, Ohio.

Henry J. Nave, director of service has been elected president of The White Motor Co. of Canada, Ltd., to succeed L. M. Hart who will continue as a director of the Canadian subsidiary. Mr. Nave joined The White Motor Co., as service sales

Henry J. Nave

Karl A. Roesch

manager in June, 1950. In December of that year he was appointed director of service.

Karl A. Roesch, assistant to the vice president in charge of sales and a White employee since 1928 was named to succeed Mr. Nave as director of service. He joined White Motor in 1928 and rose through various sales posts in Cleveland, Columbus and Cincinnati to become manager of the Cleveland branch from 1942 to 1950. In the latter year he was named assistant wholesale manager for the company.

The appointment of R. R. Meltz as manager, roll covering department, Quaker Rubber Corp., Division of H. K. Porter Co., Inc., Philadelphia 24, Pa., has been announced.

Stuart A. Falconer has been named chief metallurgist of the mineral dressing department of American Cyanamid Co., New York, N. Y., to fill the vacancy caused by the recent death of S. J. Swainson.

Sprague & Henwood's "ORIENTED" Diamond Bits

Cut Faster Last Longer Cost No More

for quick action call DIAMOND 4-8507 at Scranton

Most Economical Diamond Bits Ever Produced

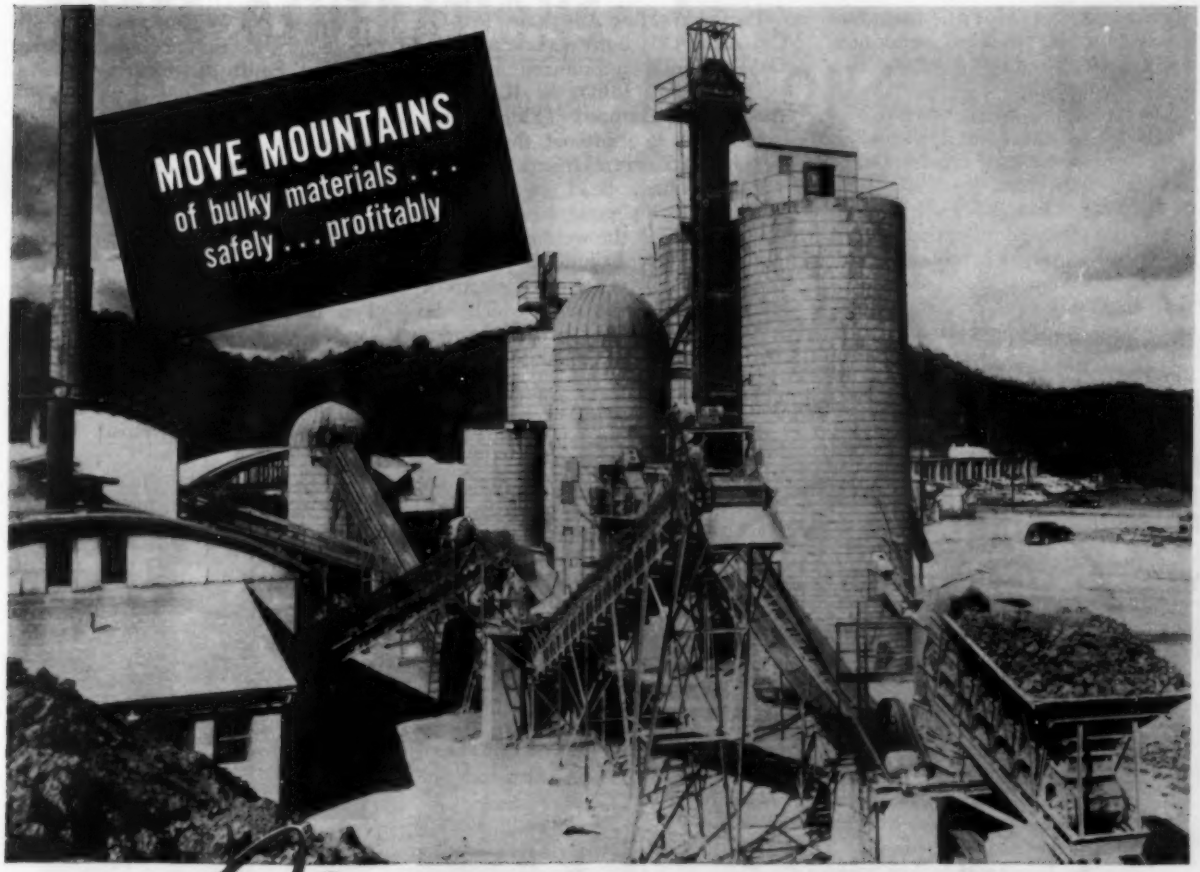
After proving in our own world-wide contract drilling operations that Sprague & Henwood Oriented Diamond Bits (in which each individual diamond is set with its hardest edge or "vector" toward the work) cut much faster and last much longer than when diamonds are set at random, we made them available to other users and THOUSANDS are now cutting costs for diamond-drill operators throughout the United States and many other countries.

Specialized equipment and large-scale production enable us to furnish them in a wide variety of types and sizes, with either cast- or powdered-metal matrices, at no advance in price; making them the most economical diamond bits ever produced.

Bulletin 320 illustrates and describes all types and gives complete working data. Write for a free copy and tell us about your diamond drilling requirements. Our experienced executives welcome opportunities to make money-saving suggestions.

SPRAGUE & HENWOOD, INC. SCRANTON 2, PENNA.

BRANCH OFFICES: NEW YORK - PHILADELPHIA - PITTSBURGH - GRAND JUNCTION, COL. - BUCHANS, NEWFOUNDLAND



inside a *Marietta* concrete storage system

Meet increasing demands for safe, easily accessible storage for bulk materials now and be prepared for the future . . . with Marietta Concrete Storage Silos.

Your Marietta System will be engineered to perform every storage and materials-handling task your plant requires, with any type of intake or discharge or mechanical handling system that will expedite your operations. Any feature desirable can be provided . . . shakers, screens, live storage shelves . . . and the extra factor of strength built into Marietta Concrete Storage Silos makes it possible to mount heavy equipment on top or sides whenever needed.

This flexibility of design, incorporated in every Marietta Storage System, easily provides for increased handling capacity for future expansion, in addition to allowing you to enjoy lower operating costs today. Write Marietta for your catalog which shows how modern Marietta Storage Systems can cut your handling costs.

MARIETTA AIR-CELL lightweight aggregate STAVES

Stronger . . . thicker than standard staves . . . an exclusive Marietta development. Give greater protection especially when dry materials are stored.

Marietta precast Air-Cell staves, made from lightweight aggregate, are 3½" thick and provide insulation value equal to 15" of solid concrete.

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Representatives in Principal Cities

PRECAST CONCRETE PRODUCTS FOR FARM, HOME AND INDUSTRY

Harnischfeger Corp., manufacturers of P&H products, announces the following changes in its two shovel divisions.

What was formerly called the "P&H Small Excavator Division" is now to be the "P&H Power Crane and Shovel Division."

The P&H Electric Shovel Division is now the official designation for this company's division in charge of all electric machine sales.

J. F. Catalane heads the Power Crane and Shovel Division and W. E. Hawkinson, Jr., is the manager of the P&H Electric Shovel Division.

Pacific Welding Alloys and Mir-O-Col Alloy Co., both of Los Angeles, Calif., jointly announced the appointment of Julian S. Kobler & Associates, Hatboro (Philadelphia area), Pa., to represent their products in the Eastern United States.

Mr. Kobler, head of the firm which bears his name, has long been associated with the welding industry. His experience includes a period of 9 years with a prominent electrode manufacturer, during which he served as quality control engineer, research engineer and later as production manager.

Arnold N. Wigle has been appointed New England representative by The Smith Engineering Works, Milwaukee, Wis.

A graduate engineer, Mr. Wigle joined the Telsmith Organization after serving as an officer in World War II. After a year in the Telsmith shops and a year in the Telsmith Engineering Department, he had several years as a Telsmith service and sales representative in Illinois, Pennsylvania, Ohio and New England.

His territory will include Massachusetts, Rhode Island, Maine, New Hampshire and Vermont with headquarters at 4 Hobart Road, Wellesley, Mass.

E. C. Thibodeau, former representative, will continue with Mr. Wigle as a consultant.

Arnold N. Wigle

Roy M. Spilman

Roy M. Spilman has been appointed sales manager by Durkee-Atwood Co., Minneapolis, Minn. He joined the company in 1947 to serve as chief engineer in the newly organized industrial division.

Through the years of his engineering activity, Mr. Spilman has been moving closer to the sales department. His work has carried him to many leading farm equipment manufacturers, truck and auto makers, as well as other users of power transmission.

The Pennsylvania Crusher Co., a wholly-owned subsidiary of Bath Iron Works Corp. since 1947, was merged with the parent company on December 31, 1954. The business will be operated as the Pennsylvania Crusher Division of Bath Iron Works Corp. In all other respects the business will continue to be conducted as before.

Swain Joseph Swainson, for many years director of American Cyanamid Company's Mineral Dressing Laboratories at Stamford, Conn., died recently at Southold, Long Island, after a prolonged illness. He was 53 years old.

FOR HIGHER THAN AVERAGE PRESSURES OF AIR, WATER

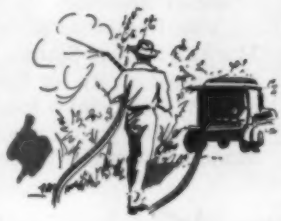
HAMILTON VARI-PURPOSE Industrial HOSE

OIL, SUN AND ABRASION-RESISTANT COVER

Tough, abrasion-resistant cover inseparably bonded to a specially compounded, oil-resistant tube, reinforced with highest quality CORDURA braided rayon cord.

A single hose to handle almost any maintenance job. Tough, resilient, durable; will carry a wide range of materials. A general purpose hose of long life and low net cost.

Available in standard lengths. Red or black covers. Sizes ¼" to 1½" I.D. with working pressures 125-300 pounds. See your local distributor.



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ALSO BELTING, TUBING, MATS, PACKING AND FLEXIBLE PLASTIC PIPE

Be sure . . . use Hamilton . . . Always dependable!

MORE THAN THREE QUARTERS OF A CENTURY OF SERVICE TO INDUSTRY

HAMILTON RUBBER MFG. CORP.

Executive Office and Factories, 109 Meade St., Trenton, N.J.

Branches in

PITTSBURGH • INDIANAPOLIS
LOS ANGELES • NEW YORK • SAN FRANCISCO
CHICAGO • CLEVELAND • HOUSTON

THREE GENERATIONS of MARION MACHINES

This pit is the work of three generations of MARION machines. First, two early MARION steamers handled the job. Then three of the famous MARION 37 machines, no longer in the MARION line.

The newest, a MARION 93-M Ward Leonard Electric, is the most popular of all, for its smooth and fast handling of a 2½ cubic yard dipper keeps a fleet of trucks busy.

This loyalty to MARION machines — this continuity of preference from one generation to another — is not unusual. It is true of many companies that are leaders in the industry.

The MARION 93-M is a true MARION "rock-master," built to stand up in continuous service in the hardest materials. Get the details on the 93-M, either diesel or electric, from your nearest MARION Representative.

MARION • OSGOOD • GENERAL O-G

MARION POWER SHOVEL CO. • MARION, OHIO, U. S. A.

A Subsidiary of Merritt-Chapman & Scott Corporation

POWER SHOVELS FROM ⅛ TO 60 CUBIC YARDS
PILE DRIVERS • WALKING DRAGLINES

DRAGLINES • CLAMSHELLS • CRANES • BACKHOES
TRUCK CRANES • MOBILCRANES • LOG LOADERS

Your Confidence Is Justified Where This Flag Flies

EXTRA HANDS
for
Mining Engineers

Lines of Naylor light-weight pipe are just like extra hands in mining service. They carry fresh water. They carry tailings. They carry high or low-pressure air and do a whale of a job in push-pull ventilating service. Because of their light weight, Naylor lines are easy to handle and install, especially with Naylor Wedge-Lock couplings to speed connections. Sizes range from 4″ to 30″ in diameter with all types of fittings and fabrications to meet layout requirements. Write for Bulletins No. 507 on pipe and No. 513 on Wedge-Lock couplings.

NAYLOR PIPE

NAYLOR PIPE COMPANY

1257 East 92nd Street, Chicago 19, Illinois

Eastern U. S. and Foreign Sales Office: 350 Madison Avenue, New York 17, New York

The choice of an all-expense tour to either the West Indies or to Mexican Cities (plus ample spending money to enjoy the trip) will be the prize for the winning salesman and his wife, in the latest sales incentive promotion being sponsored by the Baughman Manufacturing Co. of Jerseyville, Ill.

In releasing information on the contest, Jim Cadle, V.P. in charge of sales, pointed out that it will be based on the sales of Baughman Bulk Transport Bodies.

All details of the contest will be under the supervision of Ken Korte, manager of the Bulk Transport Body Division of Baughman.

The appointment of three new dealer organizations to handle sales and parts service in Texas has been announced by Euclid Division, General Motors Corp., Cleveland, Ohio. These dealer appointments include:

In northeast Texas, Conley-Lott-Nichols Machinery Co., Dallas and Longview.

In south Texas, Ingram Equipment Co., with headquarters in San Antonio and branches in Houston, Corpus Christi, Edinburg and Austin.

In west Texas east of the Pecos River and the Pan Handle, Conley-Lott-Nichols Co., of West Texas with headquarters in Lubbock and branch in Odessa.

The appointment of Paul I. Birchard as vice president and general manager of Westinghouse Air Brake Company's Le Roi Division in Milwaukee, Wis., has been announced.

Mr. Birchard will replace Edward J. Green, who has been temporary general manager of the Le Roi Division since the resignation of T. O. Liebscher, former president of the Le Roi Company.

Mr. Green will return to Westinghouse Air Brake headquarters in Pittsburgh to resume his position as executive assistant to the president.

E. J. Longyear Co. announces the appointment of the Wortham Machinery Co., of Cheyenne, Wyo., as sales representative in Wyoming and western South Dakota.

Production of the 5000th Symons Cone Crusher has been announced by D. A. Cheyette, vice president, Crusher Division, Nordberg Manufacturing Co., Milwaukee, Wis. Crusher No. 5000 is one of 37 super heavy duty 7 foot Symons Cone Crushers ordered to date by iron ore producers in the Lake Superior iron ore region to process taconite.

J. Robert Bazley, Inc., Contractor, Gets Controlled Breakage with AMERICAN EXPLOSIVES

The right American explosives, properly placed and detonated, give contractors and mine and quarry operators the kind of controlled, clean breakage that assures efficient and profitable operations.

American Explosives, blasting caps and accessories are available in a wide range of densities, velocities and strengths to meet every blasting requirement. Plants and magazines in key locations throughout the country can fill your needs, and capable field engineers are available at your call. Make your next order American.

Contractor – J. Robert Bazley, Inc., Pottsville, Pa.: shaley formation mixed with seams of medium limestone. Fourteen blast holes averaging 71 feet deep drilled in a line 30 feet apart and 30 feet back from open face.

There she goes! Holes were loaded with American Container-Cartridges containing low speed, low sensitivity dynamite, detonated with Plastic Primacord* in each hole and hooked to a trunk line of Plain Primacord.

Notice the heaving, churning motion with which the rock flowed out. Flying rock is notably absent.

This clean, even breakage means easy shoveling and loading –another good shot with American Explosives.

THE AMERICAN LINE:

HIGH EXPLOSIVES
PERMISSIBLES
BLASTING POWDER
BLASTING CAPS
ELECTRIC BLASTING CAPS — (INSTANTANEOUS, REGULAR DELAY, SPLIT-SECOND DELAY)
BLASTING ACCESSORIES

*Registered trade-mark of Ensign-Bickford Co.

AMERICAN CYANAMID COMPANY EXPLOSIVES

AMERICAN Cyanamid COMPANY
EXPLOSIVES DEPARTMENT
30 Rockefeller Plaza, New York 20, N. Y.

Sales Offices: Latrobe, Pa., Pittsburgh, Pa., Pottsville, Pa., Scranton, Pa., Maynard, Mass., St. Louis, Mo., Bluefield, W. Va.

The appointment of G. V. Woody as a special assistant to C. W. Schweers, vice president, director of sales, general machinery division, Allis-Chalmers Mfg. Co., Milwaukee, Wis., has been announced.

Previously he was manager of the firm's processing machinery department, a post he has held since 1945. He came to Allis-Chalmers in 1909.

William M. Wallace has succeeded Mr. Woody as manager of the processing machinery department. He has held several positions with Allis-Chalmers including assistant to the vice president of Allis-Chalmers general machinery division. Prior to 1951, Mr. Wallace served as a special assistant to Mr. Woody.

Schield Bantam Co., Waverly, Iowa, has just announced to their U. S. and Canadian distributors a special finance plan to help new customers buy or rent a Bantam machine.

The finance plan offers distributors a special service of financing customers through terms or on a rental basis. This new plan which was arranged through the assistance of Walter E. Heller & Co., a Chicago and New York finance company, can be used for any equipment model in Schield Bantam's line of crane carrier and crawler-mounted machines, or for just the upper machine when a customer wants to mount it on his own truck.

Caterpillar Tractor Co., Peoria, Ill., has established a new parts depot in Los Angeles to provide emergency overnight service to its distributors in southern California, southern Nevada and Arizona.

James Busey, who joined Caterpillar as a parts department employee 18 years ago, and for the past three years has managed a similar parts depot at St. Paul, Minn., has been named manager of the southern California depot. He will be assisted by Robert Webster, who joined the company in 1940, and has been an export parts supervisor at Peoria, Ill., for the last three years.

Thomas Elias Manufacturing Co., Ltd., 1061 Notre Dame Ave., Winnipeg, Manitoba, Canada is now a distributor of The Heil Co., Milwaukee, Wis. The company will cover the entire province of Manitoba in their representation of Heil body and hoist units.

Robert P. Brooks has been appointed Northwestern sales manager for Bucyrus-Erie Co., South Milwaukee, Wis. He takes over responsibility for the sales of all Bucyrus-Erie products in the states of Washington, Oregon, Idaho and Montana, the Territory of Alaska, the provinces of British Columbia and Alberta, and the Yukon Territory. He will maintain headquarters in the Seattle district sales office and residence at his present home in nearby Bellevue, Wash.

Robert P. Brooks

E. C. Brekelbaum

E. C. Brekelbaum has been appointed assistant to the general manager of The Thew Shovel Co., Lorain, Ohio.

Under his new title he will assume administrative status and will have general authority on matters pertaining to methods, engineering, and quality control covering the company's line of Lorain Power Shovels and Cranes.

Mr. Brekelbaum joined Thew in 1952 as director of methods after 17 years of association with Harnischfegar Corp., of Milwaukee, Wis.

Hose Accessories Co., of Philadelphia, Pa., announces the appointment of Durrie Sales Co., of Chicago as their representative in Illinois, Indiana, and Iowa.

Headquarters of the Durrie organization is 605 W. Washington St., Chicago, Ill.

Hamilton M. Ross has been appointed manager of operations of the Conveyors Division of Hewitt-Robins, Inc., Stamford, Conn., and Harold E. Murken has been appointed manager of conveyor system sales.

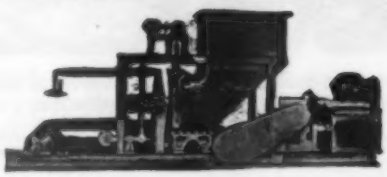
Mr. Ross has been manager of Hewitt-Robins plants in Passaic and Philadelphia with responsibility for all manufacturing and engineering functions. His new position will carry with it the additional responsibility for the sales staff in Passaic. Mr. Murken was formerly product sales manager at Passaic.

There's a Banner Profit-Year Ahead

1955

. . . for Bulk Material Processors scaling with

SCHAFFER POIDOMETERS



OVER 1300
now serving industry

Standardize on versatile SCHAFFER Poidometers for year after year, dollars-and-cents superiority in weighing, blending, feeding, mixing, recording and proportioning.

Fast, automatic, and extremely accurate, these machines supply valuable weight-data, and insure maximum flow of raw and finished materials.

Designed and built for easy operation and continuous, low-cost service, SCHAFFER Poidometers are featured in world-wide installations.

Available with remote control weighing and recording devices, and total weight recorders.

Complete Details in CATALOG No. 5

SCHAFFER POIDOMETER CO., 2828 Smallman Ave., Pittsburgh 22, Pa.

"It's in the bin..."

at low cost, with a PAYLOADER®

This 4 wheel drive "PAYLOADER" is a key production unit all year 'round at the ready-mix plant of W. E. Anderson Company, Columbus, Ohio. With 1½ cu. yd. bucket it moves as much as 1,000 tons of sand and gravel per day from the surrounding stockpiles to the storage bins.

This illustrates but one of the many popular uses for these proven tractor-shovels. They load trucks, push trucks, dig, strip, carry, stockpile, maintain haul roads, remove snow, do clean-up work and many other jobs, the year 'round. If you have similar problems, it will pay to find out how a versatile "PAYLOADER"can fit into your production plans.

See your "PAYLOADER" Distributor for full facts on this complete, proven tractor-shovel line. There's a size and type to fit your needs. The Frank G. Hough Co., 750 Sunnyside Ave., Libertyville, Ill.

PAYLOADER®

THE FRANK G. HOUGH CO. · LIBERTYVILLE, ILL.

SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

IT COSTS NO MORE

TO USE THE BEST

REPLACE WITH
"Indian Brand"

MANGANESE STEEL
Shovel Dippers
Dipper Teeth
Shovel Treads

Crusher Jaw Plates
Mantles—Concaves
Bowl Liners
Roll Shells

Pulverizer Hammers
Grate Bars—Breaker Plates

Ball Mill Liners
Screen Plates

The Frog, Switch & Mfg. Co. CARLISLE, PA.
ESTABLISHED 1881

PORTABLE
CRUSHING PLANTS
UNUSED
Universal
60-80 Tons Per Hour

20 x 36 Primary. 30 x 18 Rolls. Two 80 HP gas engines. Complete with Feeder, Conveyors. 96,000 lbs.

ONLY
$29,500.00
f.o.b. Los Angeles, Calif.
(APPROX. ½ PREVAILING PRICE.)

M. N. FRANKLIN
AND COMPANY
6403 E. Slauson Ave.
LOS ANGELES, CALIF.
Phone: RAymond 3-3188

Richard D. Hedreen, assistant manager of the Chicago sales office of the Du Pont Company's Explosives Dept., has been named manager of the department's technical service section succeeding the late Harold A. Lewis. Fred B. W. Hynes will succeed Mr. Hedreen as assistant manager of the Chicago office.

A new General Motors Training Center, opened at San Leandro, Calif., will offer service training courses on all Euclid earth moving equipment. Classes for Euclid dealer and owner service personnel will continue through early spring. Complete training facilities for proper maintenance techniques, cutaway models, complete sub assemblies for teardown, and all types of visual aid material, will be utilized.

Information and applications for enrollment may be obtained from Euclid dealers or from the Service Training Department, Euclid Division of General Motors Corp., Cleveland 17, Ohio.

The Florida Equipment Co., has been appointed exclusive distributor by the Koehring Co., of Milwaukee, Wis., to handle the complete Koehring line of heavy-duty construction equipment in Florida. The new appointee also will handle products manufactured by the Parsons Co., of Newton, Iowa, and Kwik-Mix Co., of Port Washington, Wis. Both Parsons and Kwik-Mix Companies are wholly owned subsidiaries of the Koehring Co.

W. S. Richardson is general manager of the organization located at 10 Stockton St., Jacksonville. In addition, complete equipment sales and service offices are maintained at 1228 S.W. First St., in Miami and at 1108-1110 Twiggs St., in Tampa.

Kenneth F. Rupp has joined the sales organization of the Hammond Bag and Paper Co., Wellsburg, W. Va. and will represent the company in southern Indiana and Kentucky. He recently resigned his position as assistant sales manager for Raymond Bag Co., Middletown, Ohio, after 31 years of service.

Baldwin - Lima - Hamilton Corp., Lima, Ohio, Construction Equipment Division has consolidated its manufacturing program to include the production of rubber-tired, one and two engine carriers for certain types of machines in its power shovel, crane and dragline line.

Matthew F. Keane has been appointed to the sales staff of The Raymond Bag Co., Middletown, Ohio. He will reside in Cleveland and will be responsible for multiwall paper sack sales in northern Ohio and northwestern Pennsylvania.

The stockholders of The Colorado Fuel and Iron Corp., New York, N. Y., have voted to reelect Alwin F. Franz, Arsene C. Bekaert, Charles R. Tyson, and William M. White as directors of the corporation. Their terms of service are for three years.

E. F. Hannum has been appointed district sales manager in charge of Ontario operations for the Stulz-Sickles Co., Newark, N. J. His headquarters will be in Cleveland, Ohio.

Appointment of G. Allen Lovell as assistant general manager of the mechanical goods division, United States Rubber Co., has been announced. He replaces Herbert G. Kieswetter who has been named executive assistant to the general manager of the company's international division.

FlexElex
ELECTRIC HEATING
It Has Made Child's Play Out of Screening that "Couldn't Be Done"

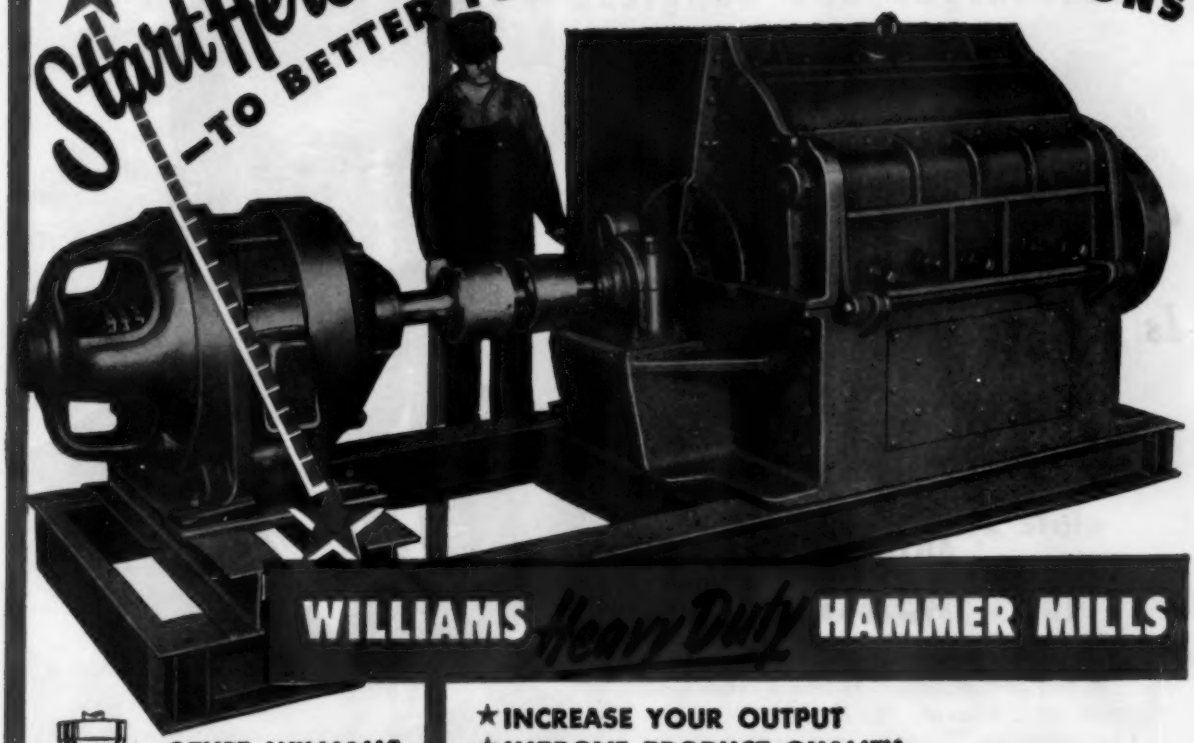
It used to be said that you couldn't screen lime, ag-lime or silica sand without frequent stops for tedious and costly cleaning of mesh.

But the Leahy Screen with both Differential Vibration and FlexElex heating of the screen jacket, available only in the Leahy, assures non-stop full capacity, accurately sized production day after day at tremendous savings in costs.

Send for Bulletin 15-J

THE DEISTER CONCENTRATOR COMPANY
911 Glasgow Avenue Fort Wayne 3, Indiana

Start Here —TO BETTER YOUR GRINDING OPERATIONS



WILLIAMS *Heavy Duty* HAMMER MILLS

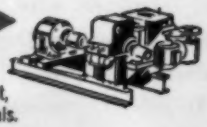
OTHER WILLIAMS EQUIPMENT

▲ **ROLLER MILLS**
—IMPACT and DRYER MILLS
—for fine grinding to 400 mesh or micron sizes

▲ **AIR SEPARATORS**
—any type; for precision control and high production in fine grinding

▲ **VIBRATING SCREENS**
1 to 3 decks, —in any size for any job. open or enclosed.

HELIX-SEAL MILLS ▶
—for dust-free grinding, and for wet, sticky, greasy materials.



Also: COMPLETE "Packaged" PLANTS for crushing, grinding, separating.

★ **INCREASE YOUR OUTPUT**
★ **IMPROVE PRODUCT QUALITY**
★ **REDUCE YOUR COST-PER-TON**

★No matter how tough your grinding, crushing or shredding job—no matter what the material; mineral, vegetable, chemical or animal—there's a Williams Hammer Mill engineered especially to get the finished product you want in a single operation—A SAVING UP TO 50% IN PRODUCTION COSTS! Extra primary and secondary crushers are unnecessary—foundations and buildings for additional machines, drives, conveyors and other equipment are eliminated—A SAVING UP TO 75% IN EQUIPMENT COST!

Many Williams exclusive design and construction features assure greater accuracy to meet the most difficult product specifications—and promise continuous satisfactory performance under the most severe operating conditions with an absolute minimum of maintenance.

Consult with Williams about increasing your grinding output and reducing your costs. Tell us about your operation at the time you Write For Complete Catalog.

★ **WILLIAMS TESTING LABORATORY WILL HELP YOU**
Complete testing and research facilities are maintained by Williams to find the right answers for you on every size reduction problem. Write for information.

WILLIAMS PATENT CRUSHER & PULVERIZER CO.
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WILLIAMS

CRUSHERS GRINDERS SHREDDERS

OLDEST AND LARGEST MANUFACTURER OF HAMMER MILLS IN THE WORLD

"Financial Security Is Based On Savings . . ."

ARTHUR B. HOMER
President
Bethlehem Steel Corporation

". . . and the purchase of U.S. Savings Bonds through the Payroll Savings Plan is one of the easiest ways for any individual to save for economic security."

If you agree with Mr. Homer that ". . . the Payroll Savings Plan is one of the easiest ways to save for economic security."—

If you believe with millions of other Americans that there is no safer investment than U.S. Savings Bonds—

Why not take a *really personal* interest in your employees and your Payroll Savings Plan?

Pick up the phone, now, and ask the man in charge of your Payroll Savings Plan three questions:

- How many of your employees are enrolled in the Payroll Savings Plan?
- What is the percentage of employee participation?
- When did your company last conduct a person-to-person canvass?

If less than 50% of your employees are enrolled in the Plan . . . if you have not conducted a person-to-person canvass in the past two years *(or if you do not have the Plan)*, act now! Telephone, wire or write to Savings Bonds Division, U.S. Treasury Department, Washington, D. C. You will hear promptly from your State Director, U.S. Treasury Department who will be glad to help you conduct a person-to-person canvass that will put an application blank in the hands of every employee. That is all you have to do. Your employees will do the rest. They want to save for their economic security.

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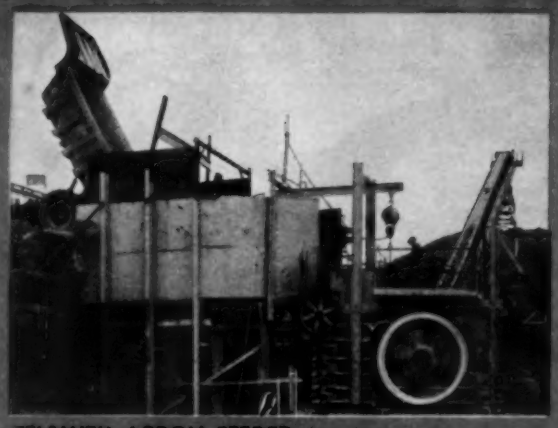
TELSMITH designed and engineered

QUARRY PLANT



TELSMITH APRON FEEDER

TELSMITH GYRATORY CRUSHER

Quarry plants engineered by Telsmith have the flexibility and big capacity that pays profits.

Send for Bulletin 266

Produces New York State Specification Aggregate for NIAGARA STONE CORP.

Averaging 250 t.p.h. this Niagara Falls, N. Y. plant makes 5 sizes of aggregate, from plus ⅛" - minus ¼" to plus 2" - minus 3", to meet New York State specs. Designed and engineered by Telsmith for versatility and high capacity this modernly equipped quarry plant supplies aggregate for highways, federal air fields, and Niagara's blacktop and ready mix plants.

TELSMITH equipment includes:

48" x 16' Heavy-Duty Apron Feeder • 5' x 12' Triple Deck Heavy-Duty Scalper • 36" x 6' Heavy-Duty Plate Feeder • 16-B Gyratory Crusher • 5' x 12' Triple Deck Pulsator Screen • 5' x 12' Double Deck Pulsator Screen Five Conveyors: 24", 30", 36" wide; total length, 775'.

TELSMITH FINISHING SCREEN

Q-30

SMITH ENGINEERING WORKS

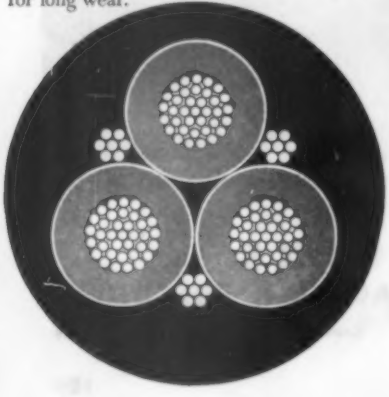
504 E. CAPITOL DRIVE **MILWAUKEE 1, WISCONSIN**

Representatives in Principal Cities in All Parts of the World • **Cable Address: Sengworks, Milwaukee**

IN OPEN PITS, ANACONDA Mine Power Cable is more rugged, shrugs off heat, cold and abrasion.

AnacondA Butyl-insulated Mine Power Cable gives longer "trouble-free" service

ANACONDA'S MINE POWER CABLE . . . It has butyl insulation and a tough neoprene jacket for long wear.



ONE BREAK in an ordinary cable can cost you more than you can possibly save buying on price alone!

A broiling hot sun. Ragged rocks. Corrosive mine water. These are good reasons you need a tough power cable.

How Anaconda builds a tougher cable

First, in making Anaconda's Mine Power Cable, we use butyl insulation. This special insulation resists heat, moisture and ozone, and has high dielectric strength.

Over the insulation goes a jacket material — a tough neoprene compound. It's flexible . . . strong . . . resists flame, heat, moisture, oil and grease, and corrosive mine water.

What's the benefit to you?

Users tell us ANACONDA Mine Power Cable lasts longer—with fewer power interruptions, less maintenance trouble. And it saves them money.

Why not see for yourself. Ask your Anaconda Sales Office or Distributor to show you a sample of this superior mine power cable. *Anaconda Wire & Cable Company, 25 Broadway, N. Y. 4, N. Y.*

54241

ANACONDA®

Flat-twin cables for: shuttle cars, continuous miners, loaders, cutters, drill trucks • Hi-volt cables for mine power. Type SH-D for shovels • Type SO and heavy-duty drill cords for hand drills, remote control • trolley wire • feeder cables • telephone wire • shot fire cord • welding cables.

From Every Standpoint / output · size · efficiency

Chrysler Industrial V-8 Engines are the best power you can install

Chrysler Industrial V-8 Engines are . . . pound for pound . . . the world's most powerful gasoline industrial engines.

To prove that statement—let's look at the facts. In the charts below, we compare Chrysler Ind. 24A V-8 Engine with similarly equipped products of five principal competitors. Information on each competitive engine is based upon factory specifications. Check the Chrysler advantages—each of them is an important factor in the selection of a power plant.

Engine	Horsepower and Piston Displacement	Pounds per Horsepower	Fuel Consumption —pounds per BHP per hour	Horsepower per Cubic Inch Displacement	
Engine A	110 at 2200 RPM 358 cu. in.	(Stripped Engine) 7.38	.54	.307	**CHRYSLER ADVANTAGES OVER ENGINE A** . . . delivers 18 more horsepower . . . weighs 96 pounds less with 24% less weight per horsepower . . . uses 7.5% less fuel at average operating speed . . . delivers 26% more horsepower per cubic inch displacement
Chrysler Model Ind. 24A	128 at 2200 RPM 331 cu. in.	(Stripped Engine) 5.58	.50	.387	
Engine B	104 at 2400 RPM* 330 cu. in.	(Stripped Engine) 6.92	(Information not available)	.315	**CHRYSLER ADVANTAGES OVER ENGINE B** . . . delivers 34 more horsepower . . . weighs 5 pounds less with 25% less weight per horsepower . . . delivers 32% more horsepower per cubic inch displacement
Chrysler Model Ind. 24A	138 at 2400 RPM 331 cu. in.	(Stripped Engine) 5.18	.50	.416	
Engine C	99 at 2200 RPM 320 cu. in.	(Stripped Engine) 7.64	.56	.309	**CHRYSLER ADVANTAGES OVER ENGINE C** . . . delivers 29 more horsepower . . . weighs 60 pounds less with 27% less weight per horsepower . . . uses 10.5% less fuel at average operating speed . . . delivers 25% more horsepower per cubic inch displacement
Chrysler Model Ind. 24A	128 at 2200 RPM 331 cu. in.	(Stripped Engine) 5.58	.50	.387	
Engine D	117 at 2200 RPM 317 cu. in.	6.5**	.50	.369	**CHRYSLER ADVANTAGES OVER ENGINE D** . . . delivers 11 more horsepower . . . weighs 19 pounds more *but* with 6% less weight per horsepower . . . delivers 5% more horsepower per cubic inch displacement
Chrysler Model Ind. 24A	128 at 2200 RPM 331 cu. in.	6.1**	.50	.387	
Engine E	97 at 2200 RPM 372 cu. in.	(Complete Engine) 12.85	.58	.260	**CHRYSLER ADVANTAGES OVER ENGINE E** . . . delivers 31 more horsepower . . . weighs 395 pounds less with 48.7% less weight per horsepower . . . uses 14% less fuel at average operating speed . . . delivers 49% more horsepower per cubic inch displacement
Chrysler Model Ind. 24A	128 at 2200 RPM 331 cu. in.	(Complete Engine) 6.6	.50	.387	

**Information not available at 2200 RPM* ***Complete engine less flywheel housing*

These are not just "paper advantages". They show up on irrigation pumps, in construction and road building equipment, in farm combines, and in many other applications. Thanks to modern engineering, hemispherical-design combustion chamber, short-stroke, low-friction construction, Chrysler offers durability and output in amazingly small, lightweight power packages.

And remember Chrysler Industrial Engines can be factory equipped for operation with gasoline, natural or L-P gas.

See a dealer or write: Dept. 131, Industrial Engine Division, Chrysler Corporation, Trenton, Michigan.

CHRYSLER
INDUSTRIAL

ENGINES

Horsepower With A Pedigree

INDUSTRIAL ENGINE DIVISION
CHRYSLER CORPORATION

BETTER THAN THE BEST BUT PRICED WITH THE LOWEST

two-way side dumping eliminates truck tie-ups ... keeps rock production high

Assurance of constant, smooth flow of rock from quarry to crusher and elimination of costly truck delays have been achieved by Buffalo Crushed Stone Co. of Bowmansville, N. Y. through a flexible system of two-way side dumping at the crusher.

The greater flexibility of this system was achieved by converting from single truck units to truck-trailer combinations—thus doubling payload capacity for stepped-up production. Since all the dump bodies are designed for two-way dumping, the trucks can roll in on either side of the crusher. Remote-control overhead dumping system enables one man to control the feeding rate and the crusher operation. Feed is uniform...truck delay is eliminated.

Each of the six trucks hauls 28 tons in two side-dump bodies; 14 tons on the truck and 14 on the trailer. They handle grades up to 10% and roll at speeds up to 27 m.p.h. on the level. Each truck makes 22 trips daily between the quarry and the crusher, hauling a total of 3700 tons and using only 1.2 gallons of diesel fuel per hour per truck.

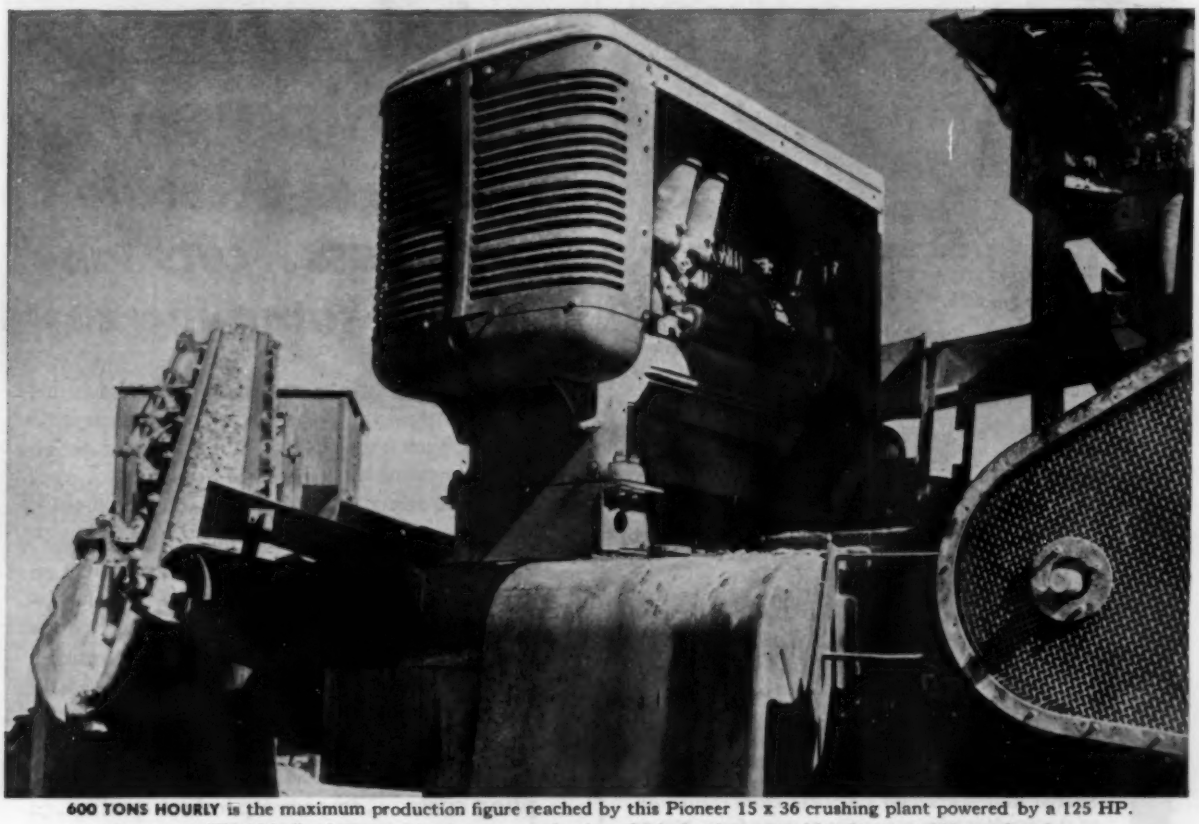
In switching to tandem operation, Buffalo Crushed Stone Co. knew they had a job calling for trucks that "have what it takes." Result: They bought Macks—six Model B-61 six-wheelers powered by Mack Thermodyne® Diesels, and equipped with heavy-duty Mack transmissions to meet stiff grade requirements.

On your job, too, Mack trucks can make the big difference by hauling more—for less.

2716

MACK TRUCKS Empire State Building, New York 1, N. Y.

"We Just Keep 'em Greased and Work 'em Hard"



600 TONS HOURLY is the maximum production figure reached by this Pioneer 15 x 36 crushing plant powered by a 125 HP. INTERNATIONAL UD-18A diesel power unit. Average production of 3-inch minus gravel levels out at 450 tons hourly.

Colorado crushing plant owner gets 8,000 hours of high production from INTERNATIONAL UD-1091 and UD-18A diesels without a single repair

The crushed rock really rolls out of the portable crushing plants owned by the Sundling Construction Company, Livingston, Montana, with two INTERNATIONAL Diesel Power Units providing the dependable, heavy-duty power.

In a period of two years, this 125 HP. INTERNATIONAL UD-18A has been driving a Pioneer 15 x 36 crushing plant and a 190 HP. INTERNATIONAL UD-1091 has been powering a larger Pioneer crusher for a total of 8,000 hours with no repairs.

As owner R. J. Sundling says: *"We can't take time to pamper engines on our crushing plants. We just keep 'em greased and work 'em hard. That's why we insist on* INTERNATIONALS."

For more than 50 years, International Harvester has been the world's leading producer of heavy-duty engines, having pioneered and perfected such features as all-weather starting, positive reserve torque control, valve-in-head construction, induction hardened crankshafts, and dust and dirt protection for long engine life.

There are 18 rugged and reliable models in the INTERNATIONAL line to meet your every pit or quarry need . . . six diesels in 4- and 6-cyclinder models . . . five 4-cylinder and seven 6-cylinder carbureted power packages . . . ranging from 16.5 to 200 net horsepower.

Get full product information or installation assistance by calling your INTERNATIONAL Power Unit Distributor or Power Unit Dealer today.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS

INTERNATIONAL HARVESTER

INTERNATIONAL®
INDUSTRIAL POWER
MAKES EVERY LOAD A PAYLOAD

STURTEVANT

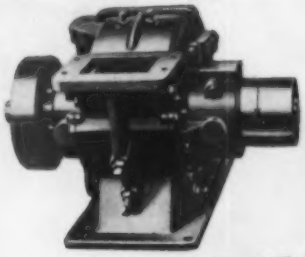
Laboratory Equipment...

assures accurate samples...cuts laboratory sampling costs

Sturtevant laboratory equipment have all the features of full-sized production machines with extra accuracy and wider range of adjustment built-in. They are fast . . . provide true samples of every batch processed.

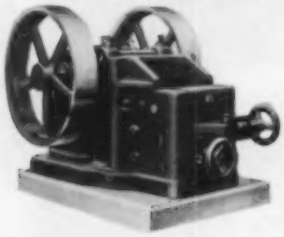
All Sturtevant machines have "open-door" accessibility which permits quick, thorough cleaning . . . prevents the possibility of previous batches from contaminating new samples. Their rugged construction assures round the clock operation with practically no maintenance.

Investigate Sturtevant equipment for your laboratories. They will help you cut sampling costs . . . improve product quality . . . increase sales. Write for catalog, today.



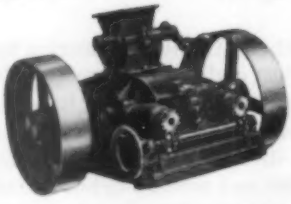
LABORATORY SWING-SLEDGE MILLS

Capable of reducing soft, moderately hard and tough or fibrous materials to any degree of fineness between 1 in. and 20 mesh. The patented "Open-Door" feature permits ready accessibility for cleaning.



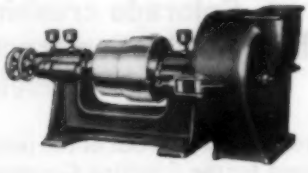
LABORATORY JAW CRUSHERS

Special Roll Jaw action simplifies close regulation of the product with capacities varying from 300 to 400 lbs. per hour at finest settings, to 1000 or 2000 lbs. when opened for coarser work. Each part of the crusher is accessible for quick and easy cleaning.



LABORATORY CRUSHING ROLLS

First designed especially for laboratory sampling work, Sturtevant Crushing Rolls are used regularly in many plants where there are limited out-puts. Range of output for the 8 x 5 size is from ½ in. to 20 mesh — and for the 12 x 12 size from ¾ in. to 20 mesh.



LABORATORY SAMPLE GRINDER

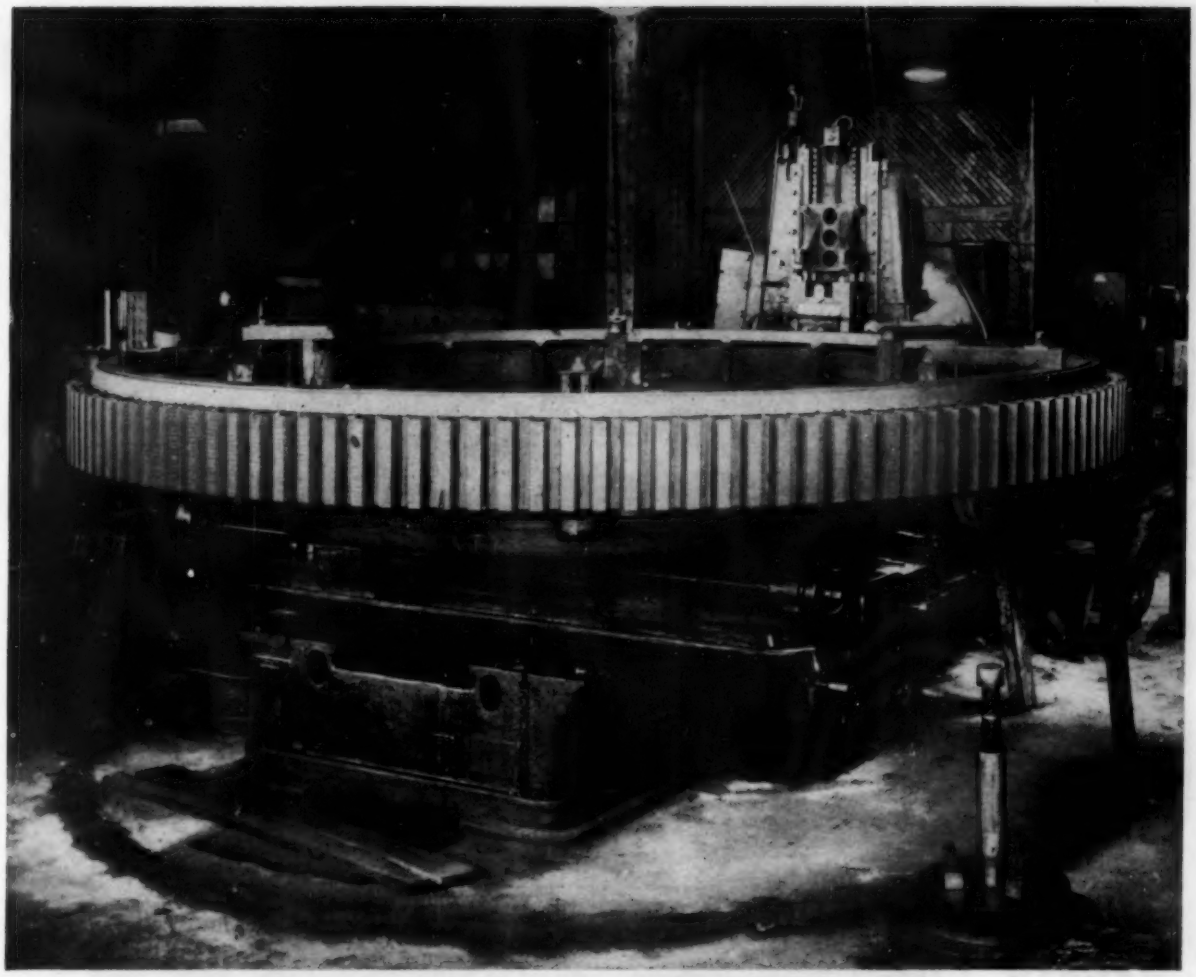
Laboratory Sample Grinders are of the "Open-Door" disc type and are capable of very fine work, producing products as fine as 100 mesh (coarser if desired) when working on dry, friable, soft or moderately hard materials. Simply turn hand wheel to provide product regulation from 10 to 100 mesh.

STURTEVANT MILL COMPANY

104 Clayton Street, Boston 22, Mass.

Designers and Manufacturers of

CRUSHERS • GRINDERS • SEPARATORS • CONVEYORS • MECHANICAL DENS and EXCAVATORS • ELEVATORS • MIXERS



Traylor machines are "geared" for profits

Precision cut steel gears are one of the big reasons why operators of Traylor mills find them economical to operate . . . less costly to maintain. Traylor drive gears have for many years been cut with high and low addendum on a Maag Gear Generator. This precision type machine tool will handle any size gear up to 22′ - 0″ in diameter. It can cut teeth up to 22″ face. That's why any size grinding mill or rotary kiln can be geared for profits by having it "Traylor-made."

SEND FOR BULLETINS . . . just mention the Traylor Equipment that interests you.

TRAYLOR ENGINEERING & MFG. CO.
716 Mill St., Allentown, Pa.
Canadian Mfrs.: Canadian Vickers, Ltd., Montreal, P. Q.

A *Traylor* leads to greater profits

SALES OFFICES · NEW YORK · CHICAGO · SAN FRANCISCO

POUND for POUND,

You Can't Beat a Bucyrus-Erie

▼ ⅜- to 4-cubic yard gasoline, diesel and single-motor electric

That's because each model in the Bucyrus-Erie line of ⅜- to 4-yd. excavators is *individually designed* all the way through from crawler treads to boom point sheaves for a definite size payload. Front end, main machinery, power unit, and mounting are all perfectly matched to dipper and bucket capacity. Maximum stability and maximum strength are obtained without that extra weight which slows down the operating cycle or adds to power consumption. That's why Bucyrus-Eries are so consistently ahead in output on loading and stripping operations.

If your quarry or pit calls for shovels or draglines with gasoline, diesel, or single-motor electric power in the ⅜- to 4-cubic yard size range, see your Bucyrus-Erie distributor for complete details on how you can step up output with a Bucyrus-Erie — the line that features Individual Design for each model. 27E54

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

THE PICTURE ISN'T RIGHT...

until you put MURPHY DIESEL into it!

The best crushing plant in the world can't be any more efficient than its power plant. And that's why more and more aggregate producers are turning to Murphy Diesel Power. Heavy duty Murphy Diesels offer an exclusive combination of design features that make it possible for you to get more aggregate per dollar of power costs. With Murphy Diesel in the picture you get greater fuel economy, longer life and dependability unmatched by any other engine of comparable size. It all adds up to a prettier profit picture for you.

Murphy Diesel offers three types of power to best suit your needs—standard power units, electric generating sets and Mech-Elec Units which will supply both mechanical and electrical power separately or simultaneously. Ask your Murphy Diesel Dealer to give you complete information on the unit that will serve you best.

MURPHY DIESEL COMPANY

5307 W. Burnham St. Milwaukee 14, Wisconsin

Sales, parts and service throughout the nation

MURPHY DIESEL

310

***Heavy duty power* for rock crushing**

Murphy Diesel Engines and Power Units are available in sizes from 90 to 240 H.P. Engine speeds are 1200 and 1400 rpm. "Packaged" generating units are available with capacities ranging from 60 to 154 K.W.

Tractor parts rebuilt with

AMSCO LEADER AUTOMATIC ELECTRIC WELDER

Save contractor $10,000 over replacement parts, double service life

If you operate track-type equipment, here's an automatic electric welder that is a *must* for your maintenance shop. It will save you time and money, and radically increase service life of your present equipment.

See what it did for one construction outfit:

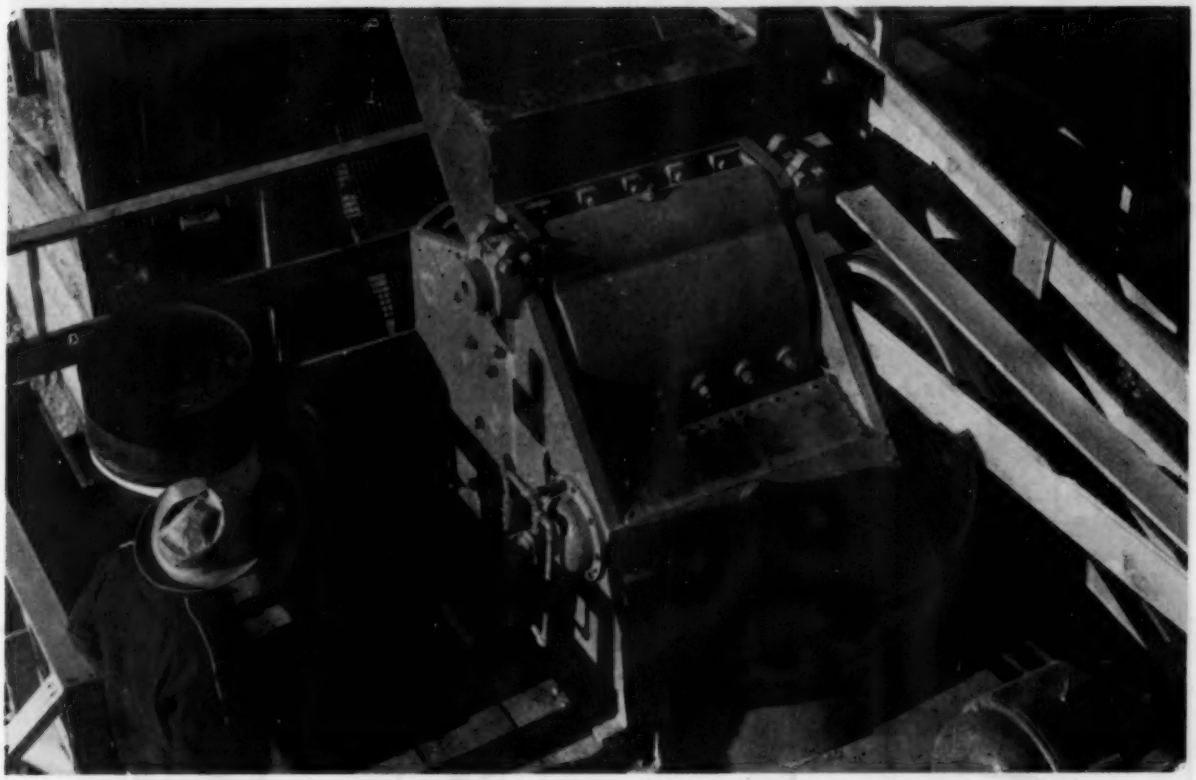
Operating five large track-type tractors, each with 12 bottom rollers, 4 carrier rollers, 156 track links, 78 grouser pads, 2 idlers, 2 sprockets and one dozer blade, replacement cost was figured to be approximately $13,800. Rebuilding these parts with the Amsco Leader cost approximately $3,700, or a saving of about $10,000. Plus the fact that the rebuilt parts gave nearly double the effective service life of the new parts.

See your local Amsco Distributor today. Ask him for complete details on the Amsco Leader. See for yourself how a new Amsco Leader can save you thousands of replacement dollars.

AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Ill.

KUE-KEN is the lowest price crusher



With its higher operating speeds, Kue-Ken crushes 25% to 50% more rock per inch of jaw width than any other crusher (and provides a more cubicle product)

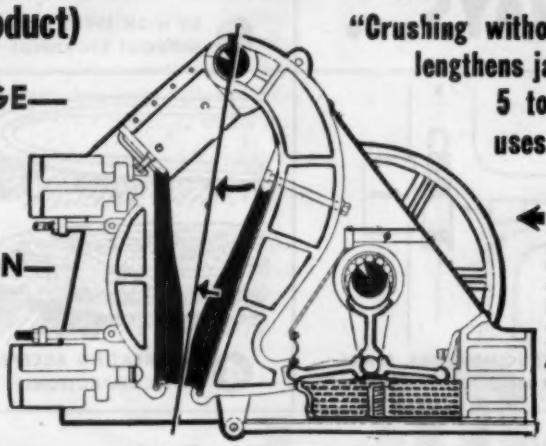
NO SHAFT OR FRAME BREAKAGE—

a built-in safety device releases flywheel instantly on overload. No shearing or breaking parts. Quickly reset.

CRANKCASE TYPE LUBRICATION—

Kue-Ken is the only crusher whose mechanism operates in a bath of filtered, dust-free oil. Mechanism is protected from wear for life of crusher. Toggles do not wear out. Change oil twice a year.

"Crushing without rubbing" lengthens jaw plate life 5 to 10 times... uses less power



See how the Kue-Ken hinge pin is located on the center line of the crushing zone. The jaw moves in an almost straight line. Rock is instantly gripped and crushed without rubbing.

Write for catalogs

STRAUB MFG. CO., INC. 8382 BALDWIN • OAKLAND, CAL.

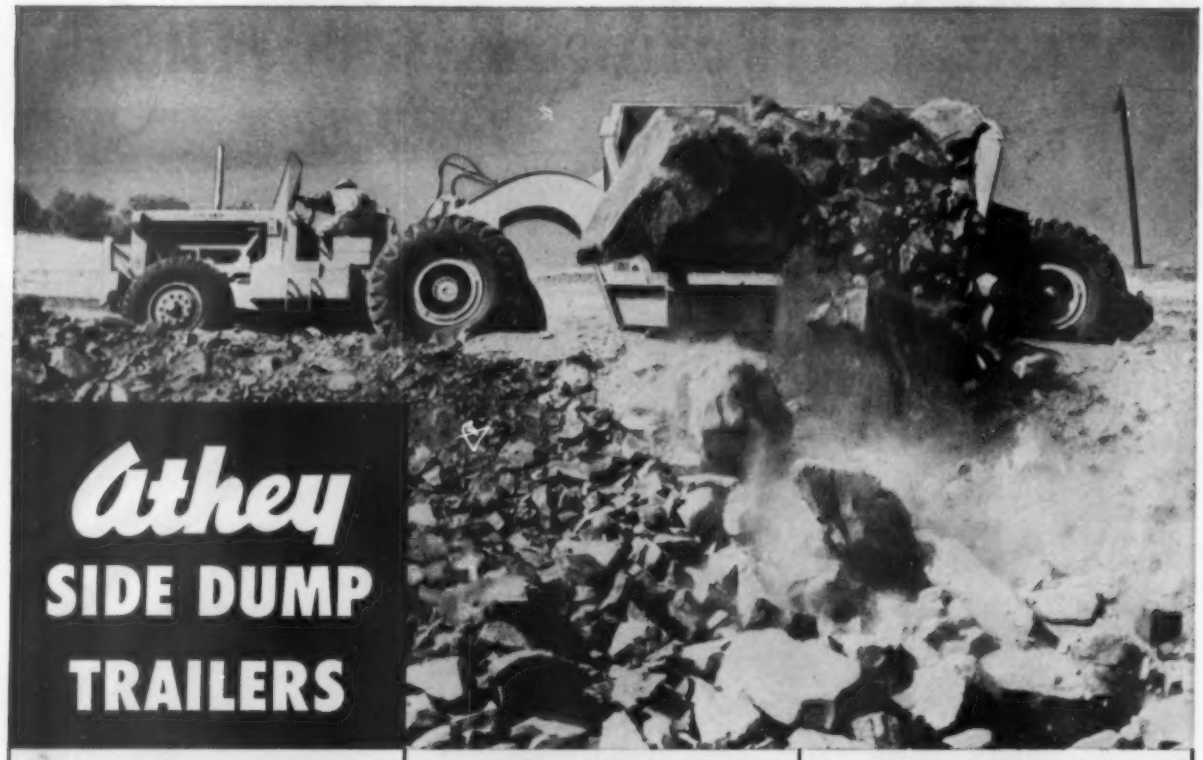
DEALERS: **LUND MACHINERY CO.**, Salt Lake City, Utah; **CLOSNER EQUIPMENT CO.**, San Antonio, Texas; **WASHINGTON MACHINERY CO.**, Seattle, Wash.; **CONSTRUCTION EQUIPMENT CO.**, Spokane, Wash.; **CONTRACTORS EQUIPMENT CO.**, Portland, Ore.; **GARLINGHOUSE BROS.**, Los Angeles, Calif.; **ANAHUAC MACHINERY CO.**, Mexico City, Mexico; **UNIVERSAL EQUIPMENT CO.**, Vancouver, B. C.

KUE-KEN CRUSHERS

"LOWEST COST-PER-TON CRUSHING"

Jaw Crushers · Gyratory Crushers · Overhead Eccentric Crushers · Revolving Screens
Classifiers · Feeders · Rib Cone Ball Mills · Concentrating Tables · Vibrating Screens

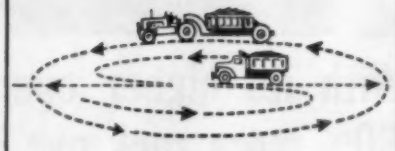
Pennsylvania Crusher Co., Exclusive Licensed Eastern Manufacturer and Distributor, 323 S. Matlack St., West Chester, Penn.
Armstrong Whitworth (Metal Industries) Ltd., Authorized Licensed Manufacturer and Distributor. Close Works, Gateshead-upon-Tyne 8, England



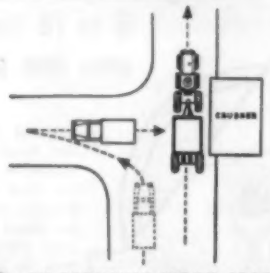
Athey SIDE DUMP TRAILERS

SAVE MONEY 5 WAYS...

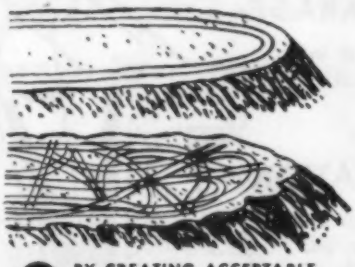
1 BY HIGH-SPEED DUMPING WITHOUT STOPPING!



2 BY ELIMINATING DANGEROUS CRISS-CROSS TRAFFIC!



3 BY REDUCING WORK SPACE AT CRUSHER OR HOPPER!



4 BY CREATING ACCEPTABLE FILL COMPACTION!

5 BY BUILDING THE FILL OR DUMP AUTOMATICALLY!

Your Athey-Caterpillar Dealer can show you these 5 money-saving advantages—and many others—of the Athey PD20 or PD10 Trailers. Call on him for all the facts, or write for the new ATHEY PD20 SIDE DUMP TRAILER folder!

ATHEY PRODUCTS CORPORATION
5631 WEST SIXTY-FIFTH STREET
CHICAGO 38, ILLINOIS

The Pay Off!

Strange things frequently happen inside industrial stacks! Buell specialists can tell you, for they've spent the past twenty years finding out!

That's why so many of America's Leading Corporations depend on Buell knowledge and experience for the *recovery of valuable industrial dusts*. They know, for example, that Buell maintains a modern laboratory devoted to the analysis of industrial dust. They know that Buell provides three separate systems of industrial dust recovery. They know that the Buell Cyclone combines simple design with high efficiency . . . low maintenance. They know that the famous Buell Spiralectrode is setting dust collection efficiency records in the Buell 'SF' Electric Precipitator.

Why take risks? Let Buell Engineers help resolve your dust collection problems. They can forecast results in advance . . . before you spend a single penny!

Get the complete facts about *all three* Buell Systems of Industrial Dust Recovery. Write for your free copy of "The Collection and Recovery of Industrial Dusts". Dept. 16-A, 70 Pine Street, New York 5, New York.

buell®

MECHANICAL ELECTRICAL

20 Years of Engineered Efficiency in

DUST RECOVERY SYSTEMS

"Your PERMANENTE brick lining in this kiln has smashed all records here for service. The kiln came down after a run of 18 months, 8 days—topping the previous record by 2 months. This is 6 times the life we used to get with 70% alumina."

This report from a leading cement producer is only one of many showing how Permanente Periclase-Chrome A brick dramatically improves hot zone service.

This improved service is possible because Permanente Brick is *especially designed* for hot zone linings to provide great volume stability under loading, high resistance to spalling and to chemical attack by cement clinker at high temperature. Think what this means in shutdowns eliminated!

In addition, Permanente Periclase-Chrome A Brick takes a good coating in the kiln, usually without inducement.

If you are not yet using Permanente brick, let us show you *now* how its superior performance can give you increased clinker production at lower cost!

[*Call or write* Kaiser Chemicals Division, *Kaiser Aluminum & Chemical Sales, Inc. Regional Sales Offices: 1924 Broadway,* OAKLAND *12, California . . . First National Tower,* AKRON *8, Ohio . . . 518 Calumet Bldg., 5231 Hohman Avenue, Hammond, Indiana* (CHICAGO).]

Kaiser Chemicals

Pioneers in Modern Basic Refractories

Alumina • Basic Refractory Brick and Ramming Materials • Dolomite • Magnesia • Magnesite • Periclase

40 PAGES of helpful information

on Recovering Dusts, Fly Ash, Mists, Fumes and other Suspensions from Gases.

This booklet summarizes
the important points design and plant engineers should know about Cottrell Precipitators . . .

- Basic types of Cottrell equipment.
- Principal elements in a Cottrell unit.
- Data on Mechanical and Electronic Rectifiers.
- Various types of Collecting Electrodes (rod curtains, corrugated plates, pocket electrodes, etc.).
- Typical ways of removing collected material.
- Various Shell Constructions (steel, concrete, brick, etc.).
- The effect of various factors on efficiency and performance.
- Data on CMP (Combination Multiclone-Precipitator) Units.

. . . and many other helpful facts on Cottrell design and operation.

Latest data from Western Precipitation on Cottrell Recovery Equipment

Do you have operations in your plant where gas-laden suspensions, wet or dry, are a problem? Such suspensions may be dropping on surrounding property, causing nuisance difficulties. Or perhaps important values are being lost in stack gases that can be profitably recovered. Whatever the nature of your recovery requirements, you will find this 40-page Cottrell booklet of great help. It contains up-to-date data on the latest advancements in the electrical precipitation field – prepared by the organization that pioneered the commercial application of Cottrell Electrical Precipitators almost a half century ago and has consistently led in new Cottrell developments.

A copy of this data-packed booklet will be sent free to engineers and other executives interested in recovery processes. Send your request to our nearest office.

For nearly 50 years Western Precipitation has carried on a continuous research and development program on Cottrell Electrical Precipitators, Multiclone Mechanical Collectors and other types of recovery equipment. We are not affiliated with any other company in the electrical precipitation field except our wholly owned subsidiaries, International Precipitation Corporation and the Precipitation Company of Canada, Ltd. We are equipped to serve you anywhere in the United States, Canada, and throughout the world!

WESTERN Precipitation CORPORATION

DESIGNERS AND MANUFACTURERS OF EQUIPMENT FOR COLLECTION OF SUSPENDED MATERIALS FROM GASES & LIQUIDS

Main Offices: 1015 WEST NINTH STREET, LOS ANGELES 15, CALIFORNIA
CHRYSLER BLDG., NEW YORK 17 • 1 N. La SALLE ST. BLDG., CHICAGO 2
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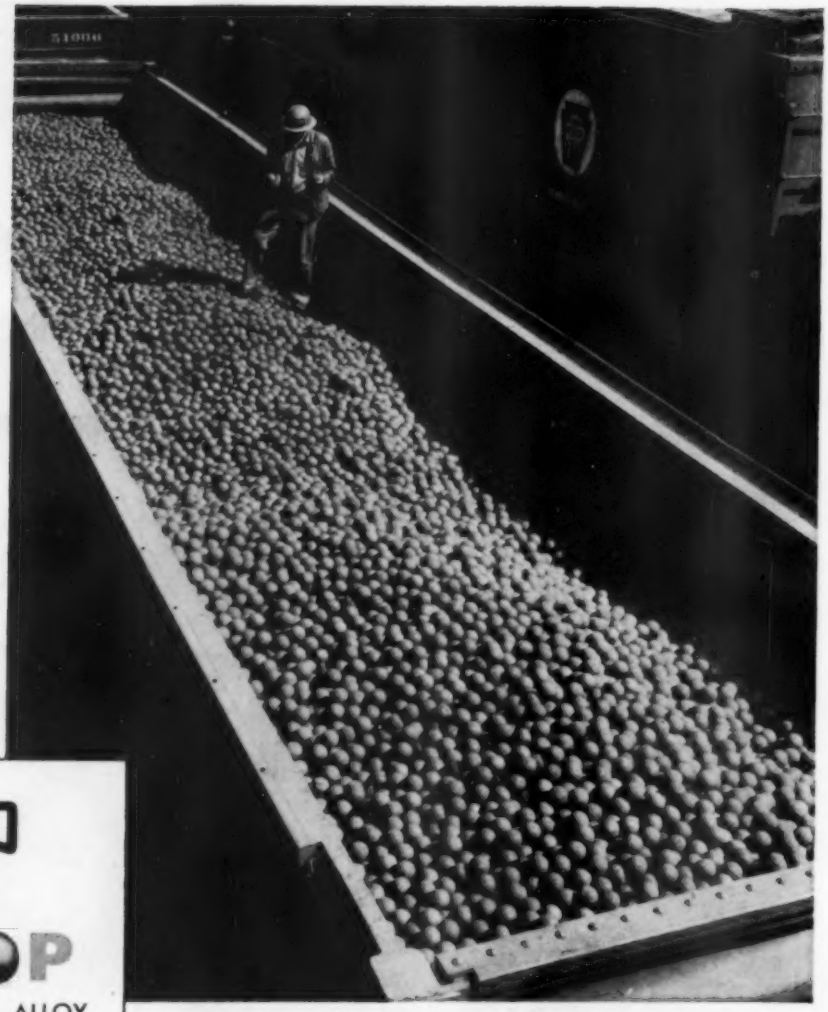
PRECIPITATION CO. OF CANADA, LTD., DOMINION SQ. BLDG., MONTREAL

Ready to Roll for a Longer Grind



SHEFFIELD

ARMCO

MOLY-COP

TRADE MARK

COPPER • MOLYBDENUM • ALLOY
GRINDING BALLS

This carload of Moly-Cop Grinding Balls might be headed to any one of hundreds of destinations around the world. Sheffield ships them everywhere grinding is part of the industrial picture.

Wherever they go, they'll do a better grinding job. Fewer chargings will be required. Less down time. Less frequent freight bills. Money saved.

That's because Moly-Cop Grinding Balls keep their spherical shape longer. Sheffield's special alloy of steel, copper and molybdenum is just the right "recipe" for longest resistance to wear, chipping and abrasion. There's a big difference in grinding balls—and it will show up on your profit sheet when you use Moly-Cop Grinding Balls.

We're ready with the best grinding ball—plus engineering counsel on how it can best save money in your operation. A call will get you all the facts.

SHEFFIELD STEEL
DIVISION
ARMCO STEEL CORPORATION
SHEFFIELD PLANTS: HOUSTON KANSAS CITY TULSA

EXPORT REPRESENTATIVES: ARMCO INTERNATIONAL CORPORATION • Middletown, Ohio

Pace-Setting HD-5G Tractor Shovel

NOW BETTER 3 WAYS

HD-5G TRACTOR SHOVEL

Rated capacity	1¼ cu yd
Belt horsepower	50
Weight, complete	16,200 lb
Dumping height	9 ft, 2 in.

From the time of its introduction seven years ago, the Allis-Chalmers HD-5G Tractor Shovel has been tops in popularity. Many thousands are daily proving their ability and versatility on all kinds of material handling and excavating jobs.

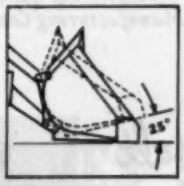
Now, design refinements make the HD-5G a three-way better value than ever before:

1. Has Bigger Rated Capacity

New bucket handles a big 1¼-yd load — streamlined design now helps roll in large loads with less tractor effort. The back of the bucket has been brought forward and the sides extended to cut spillage, put more payload where it's wanted.

2. Helps the Operator Do More

Cleaner dumping with the new bucket saves the operator time and effort shaking out loads.

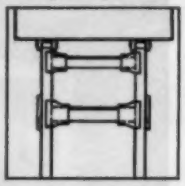


For added versatility, there is a two-position bucket available with both standard automatic return to digging position and operator-controlled tip-back. If the operator chooses to use the controlled tip-back, he can load the bucket, then tip it back approximately 25° before raising, assuring maximum output under special conditions such as downhill loading or loading loose materials.

The HD-5G helps the operator do more in other ways, too — giving him full vision, fast and easy control, cleaner platform and more comfortable seat from which to work, and more working time with truck wheels, support rollers and idlers that need greasing only once every 1,000 hours.

3. Works at Lower Cost

The HD-5G now works at even lower cost than ever before — not just because it *does more*, but because it has features that mean *less maintenance, longer life.* For instance, new type tubular bracing on the bucket booms provides added strength and support, keeps the bucket in line. The floor at the rear of the new bucket has been raised seven degrees to reduce wear on the bottom sheet. Heavy-duty truck wheels and idlers are available for particularly tough working conditions. One-piece, full-length main frame permits unit construction so that major assemblies can be removed without disturbing adjacent units, putting tractor back on the job in hours rather than days.



Ten Quick-Change Attachments Add to HD-5G Versatility

Bulldozer	Crane Hook	Tine Fork
Angledozer	Light Material Bucket	Rock Fork
Narrow Bucket	Trench Hoe	— also rear-mounted Ripper
Rock Bucket	Lift Fork	

See your Allis-Chalmers dealer for more about these and other production-boosting features of the popular HD-5G Tractor Shovel.

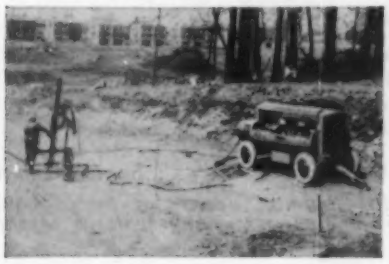
ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

Two "600" portables at work on a mountain road job.

Three "600" compressors used on the New York Thruway.

A "125" operating on roof of a Dallas skyscraper.

This "315" powers paving breakers on a Pittsburgh construction job.



A "600" with Joy Wagon Drills on a Philadelphia housing project.

Joy "600" compressor operating a Joy Challenger Hammer Drill in a New York crushed stone quarry.

JOY PORTABLE COMPRESSORS

...efficient, dependable in all kinds of service

You'll find Joy Portable Compressors on a variety of jobs, in all parts of the world. Check the owners . . . you'll get reports of consistently fine performance and complete dependability from the tried and true design.

Joy's background of 45 years in the portable compressor field has paid off in the development of these many fine features found in all Joy portables:

FOR PERFORMANCE Low-lift, large port-area, "direct-concentric" valves. Efficient air cooling, cross-flow intercoolers, matched engines, full force-feed lubrication to every bearing and working surface.

FOR DEPENDABILITY Oversize receivers, main bearings and starting equipment. Three-point engine-compressor suspension, rifle-drilled connecting rods and lightweight pistons. Welded steel frames and "bulkhead" body construction.

Five sizes are available—from 75 to 600 cfm. For details on how you, too, can benefit from Joy's field-proved design, write for free bulletin #A-55, to **Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.** In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ontario*

JOY

WSD C5480

CONSTRUCTION EQUIPMENT MANUFACTURERS
FOR OVER HALF A CENTURY

Are you getting results like this?

MISSION: Move a 22′ limestone burden off this 57′ quarry face. Get good breakage, good control of throw. But hold noise and vibration to a minimum.

METHOD: Shoot it with ROCKMASTER® milli-second delay caps and APEX® "cored" explosives.

Combination shot. Alternate blast in center gives the "one-two" punch. Progressive blasts at both ends wave down face . . . tear away rock with minimum vibration. Good bottom breakage.

Excellent confinement. Excellent control. No visible air blast. Muck pile shows good fragmentation. Well spread for easy digging.

To look at these photographs, you'd hardly recognize a "blast" taking place. Where are the big explosion, the clouds of dust and smoke, the flying boulders? You don't see them! That's real blasting efficiency!

And this is the rule—not the exception—at Pallette Stone Corp., Saratoga, N. Y. Shooting with ROCKMASTER milli-second delay caps at the bottom of the holes, the blast is confined to the burden. The explosives go to work on the rock—not the air. Here's a ready-made, workable muck pile...easy bite for the shovel, easy work for the crusher.

You may be able to get results like this, too. Ask your Atlas representative about ROCKMASTER, the safe, modern method of delayed-action blasting that gives you better breakage with less "blast."

BLAST DATA:

Height of face	57′
Burden	22′
Number of holes	12
Diameter of holes	6¼"
Depth of holes	62′
Spacing	24′
ROCKMASTER delays	2 & 3
(Alternate pattern: Apex #3 LV)	
Stemming	15′
Powder factor	3.2
Total tons	30,559
Total explosives	9,325 lbs.
Loading starting	8:00 AM
Loading finished	1:00 PM
Blast fired	4:10 PM

ATLAS

ATLAS EXPLOSIVES

"Everything for Blasting"

ATLAS POWDER COMPANY.
WILMINGTON 99. DELAWARE

Offices in principal cities

GET "BETTER BLASTING"

If you are not already getting this informative periodical, let us put your name on our mailing list today.

(P. S.—Tell us who else in your organization should get "Better Blasting", too.)

Outstanding performance is Standard performance

with B&W Feed Pipes...

Tail-Ring Castings

In cement kilns throughout the industry, long-lived B&W alloy Tail-Ring Castings and Feed Pipes have established a firm reputation for outstanding performance and economy by reducing operating costs and contributing to sustained high production.

B&W Tail-Ring Castings withstand temperatures exceeding 1800 F at the feed end of the kiln; standard kiln lining only is needed. These castings provide a kiln opening of proper size, and are designed with overlapping segments, which prevent loss of feed material and allow ample expansion to minimize the possibility of belling out of the kiln shell.

Because greater resistance to heat and wear is "built in" at the foundry, B&W cast alloy Feed Pipes consistently outlast conventional types by wide margins under the most rigorous service conditions. A typical design, illustrated, incorporates a special clamp, located according to specific service conditions, and permitting renewal of *only* the lower portion of pipe after years of punishing service . . . a further cost-saving feature.

Feed end of kiln, with B&W Feed Pipe

Application of Tail-Ring Castings

For detailed information in relation to your requirements write: The Babcock & Wilcox Company, Process Equipment Dept., Barberton, Ohio.

BABCOCK & WILCOX

S-424

Wire Rope at Work—At DeBardeleben Coal Corporation, Empire, Ala., tough stripping jobs like this one are part of the daily program. Thirty-seven feet of overburden is here being removed from the coal seam, and it is rough going, due in part to the large sandrock formations.

The dragline excavator is rigged with a 10½-yd bucket; the shovel with a 2-yd bucket. To help combat the very mean conditions, both machines use Bethlehem wire rope, Purple Strand grade, for hoist and boom lines. The big dragline, a 2⅛-in. rope, is also Purple Strand. In a service that is unusually severe, these Bethlehem ropes have shown the stubborn toughness and strength that are always the mark of top performers.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Stee Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:
MINING • CONSTRUCTION • PETROLEUM • EXCAVATING • QUARRYING • LOGGING • MANUFACTURING

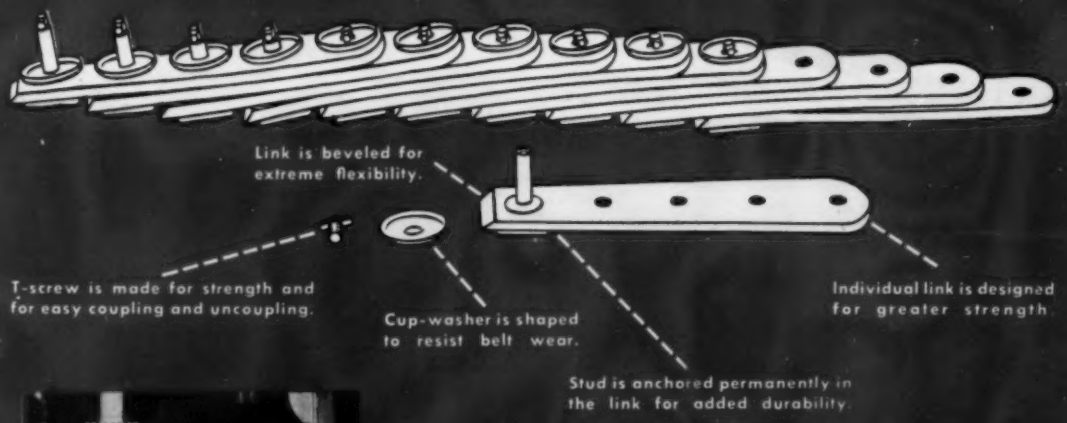
ON January first of this year, Dorr-Oliver Incorporated became a corporate entity through the merger of The Dorr Company, Engineers and Oliver United Filters Incorporated. Not a merger in name only, the combined staffs, engineering skills and facilities of the two organizations are being welded into a single unit, with a vastly increased capacity to serve on a worldwide basis.

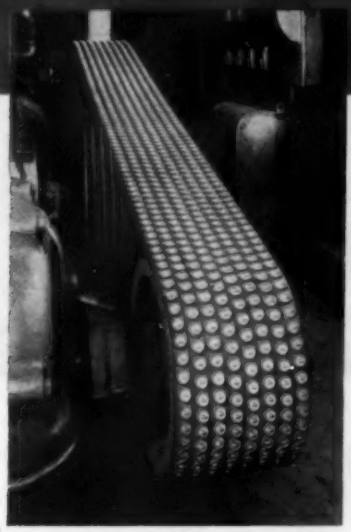
Both companies have their roots in gold ore metallurgy. The Dorr Company was founded by John Van Nostrand Dorr on his early inventions, the first of which was developed in 1904 to solve the problem of mechanical classification of gold ores. Oliver United had its beginning in 1907 with the development of the first successful continuous vacuum filter by Edwin Letts Oliver and its practical application to the cyanide process. Since their inception, both companies have grown steadily in technical stature to positions of leadership in their ever-widening and complementary, fields.

This cumulative, combined experience . . . coupled with a progressive faith in the future . . . is the strength of Dorr-Oliver. For present and future clients alike throughout the world it means better solutions to process problems in those fields of metallurgical, chemical, industrial and sanitational engineering in which Dorr and Oliver have specialized for nearly half a century.

DORR-OLIVER
INCORPORATED
STAMFORD, CONNECTICUT, U. S. A.

This detailed line drawing of the new, patented Veelos TD and TE v-belt makes it easy to see how this new v-belt is designed to do a better job . . . easier!


Link is beveled for extreme flexibility.
T-screw is made for strength and for easy coupling and uncoupling.
Cup-washer is shaped to resist belt wear.
Stud is anchored permanently in the link for added durability.
Individual link is designed for greater strength



New VEELOS

TD and TE Adjustable V-belt

So easy to couple *it installs in minutes*

So strong and durable *it lasts for years*

The new Veelos TD and TE adjustable v-belt is the successful development of a specific v-belt designed for a specific service—D and E drives.

This new Veelos TD and TE v-belt has these basic advantages . . .

It simplifies installation. Links are quickly joined by easy-to-use cup-washers and T-screws to make up individual belts. It's the easiest v-belt to couple and uncouple ever developed. And you don't need to waste time removing outboard bearings.

It lasts longer—is more flexible. New high-tensile strength link combined with new stud, cup-washer, and T-screw gives added durability. New link construction provides maximum flexibility for cooler, wear-resistant running.

Get the complete story of this great new v-belt for D and E drives. Send coupon now for new 8-page illustrated catalog.

VEELOS
THE LINK
V-BELT

Veelos is known as Veelink outside the United States.

MANHEIM MANUFACTURING & BELTING CO.
654 Manbel St., Manheim, Pa.

Please send copy of your new Veelos TD and TE v-belt catalog.

Name .....

Company .....

Address .....

.....

ADJUSTABLE TO ANY LENGTH • ADAPTABLE TO ANY DRIVE

2000 TONS PER DAY!

PERRY JONES CONSTRUCTION CO. of Carbondale, Kansas, operates the Stull Quarry, near Lawrenceville. The daily average of 2,000 tons of crushed limestone is produced in 9 hours. Backing up that steady production pace are the two 2-yd. Lorain Shovels, model 820-K, which are shown in the photo. Working against an 18-ft. face, these two Lorains keep the Jones portable crushing plant going at top speed.

The Hydraulic Coupling power take-off (fluid drive) pays big dividends. Digging shocks that are unavoidable in every digging operation just can't be transmitted to the mechanism and cables because the Hydraulic Coupling absorbs and smothers them. Machine life is lengthened, service and maintenance are reduced. Because of the Hydraulic Coupling, the engine will "hang-on" until the toughest rock is in the dipper. You can't stall the engine under even the toughest digging circumstances.

The Double Center Drive Pinion on the turntable transmits power directly by multiple roller chain drive to Swing Shaft, Crowd-Travel Shaft, and Hoist Shaft to give you power where you want it—when you want it. It permits concentrating full power on any one of these 3 operations or distributing power in proper relation to 2 or 3 simultaneous and synchronized operations . . . a tremendous advantage in tough digging. Air-assist controls add ease to moving more rock.

The big "820-K" crawler brings you a combination of steady footing, convenient maneuverability, plus long-life strength. There is independent crawler travel which may be combined with hoist and swing operations for simultaneous operation. There are two travel speeds in both directions, a 4-way, tread-travel lock and rugged, heat-treated, drop-forged treads . . . and there are air controls for steering, crawler tread lock and turntable jaw clutches for improved operator efficiency and ease of operation. See your Thew-Lorain Distributor today!

THE THEW SHOVEL CO., LORAIN, OHIO

THEW LORAIN

THE TOUGHER THE DIGGING — THE MORE REASON WHY YOU SHOULD SEE YOUR THEW-LORAIN DISTRIBUTOR

Why brute loads don't "bust" this screen

● Here's a screen built to take abuse . . . a screen specifically designed to handle large quantities of *big, heavy* rock and ore.

The main frame of this powerful PIONEER Mesabi Vibrating Screen is built from 18" car channel or I-beams and reinforced with 8" wide flange cross beams. Screen frames are constructed from extra-heavy channels, pipe, angles, and bars. Pan side thicknesses range from ⅜" to ½", depending on size of screen. Angle bracing at critical points adds further strength and rigidity. Beefed-up shafts are built to take it.

EFFICIENCY. PIONEER Mesabi screens are not only rugged, but you just can't beat them for fast, accurate separation.

That's because PIONEER's full circle, forward throw agitation produces an identical, positive motion from one end of the pan to the other. Every inch of this screen works for you.

Near-perfect balance is maintained by placing the shaft at the pan's exact gravitational center and counterbalancing the flywheels to offset the throw of the pan. This gives precise end-for-end, top-for-bottom balance at all times. Since vibration is confined to the pan and not transmitted to the frame, less power is needed and equipment lasts longer.

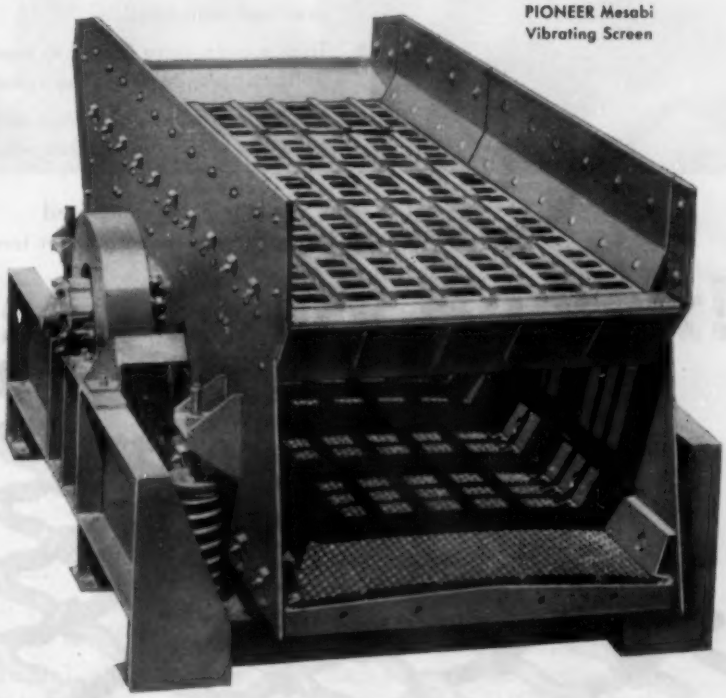
OUTPUT. PIONEER screens are known for their extra capacity. Positive throw, down-hill agitation, and use of the entire screen surface, combine to deliver maximum tonnage.

SPECIFICATIONS

Size	Horsepower	Approximate weight in pounds		
		1 Deck Scalping	2 Deck Scalping	2-Deck Gradation
4'x10'	15	8,900	8,800	8,000
4'x12'	15	10,000	10,000	9,100
5'x10'	20	11,800	11,800	11,000
5'x12'	20	12,800	12,700	12,000
5'x14'	25	13,700	13,600	13,000
6'x12'	30	14,550	14,200	13,800
6'x14'	30	15,800	15,300	14,900

Ask your screen salesman these questions

1. Will frame resist sagging and twisting under heavy loads?
2. Is vibration effectively confined to pan?
3. Do both ends of screen vibrate equally with the middle?
4. How efficient, percentagewise, is separation?



PIONEER Mesabi Vibrating Screen

For detailed features, specifications, and performance data, write Pioneer Engineering Works, Inc., Minneapolis 13, Minnesota, or see your nearest PIONEER Distributor.

BUY BOTH! HIGHER OUTPUT LOWER UPKEEP

Pioneer *Continuflo* EQUIPMENT

Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis 13, Minn.
Subsidiary of Poor & Company • Chicago
Please send information on equipment checked.

- ☐ GRAVEL PLANTS
- ☐ WASHING PLANTS
- ☐ MECHANICAL FEEDERS
- ☐ ROCK PLANTS
- ☐ BITUMINOUS PLANTS
- ☐ VIBRATING SCREENS
- ☐ JAW CRUSHERS
- ☐ APRON FEEDERS
- ☐ BUZZER SCREENS (LIGHT DUTY)
- ☐ ROLL CRUSHERS
- ☐ ORO FEEDERS
- ☐ CONTINUFLO CONVEYORS

*Name*_____

*Company*_____

*Address*_____

*City*_____ *Zone*____ *State*_____

what does

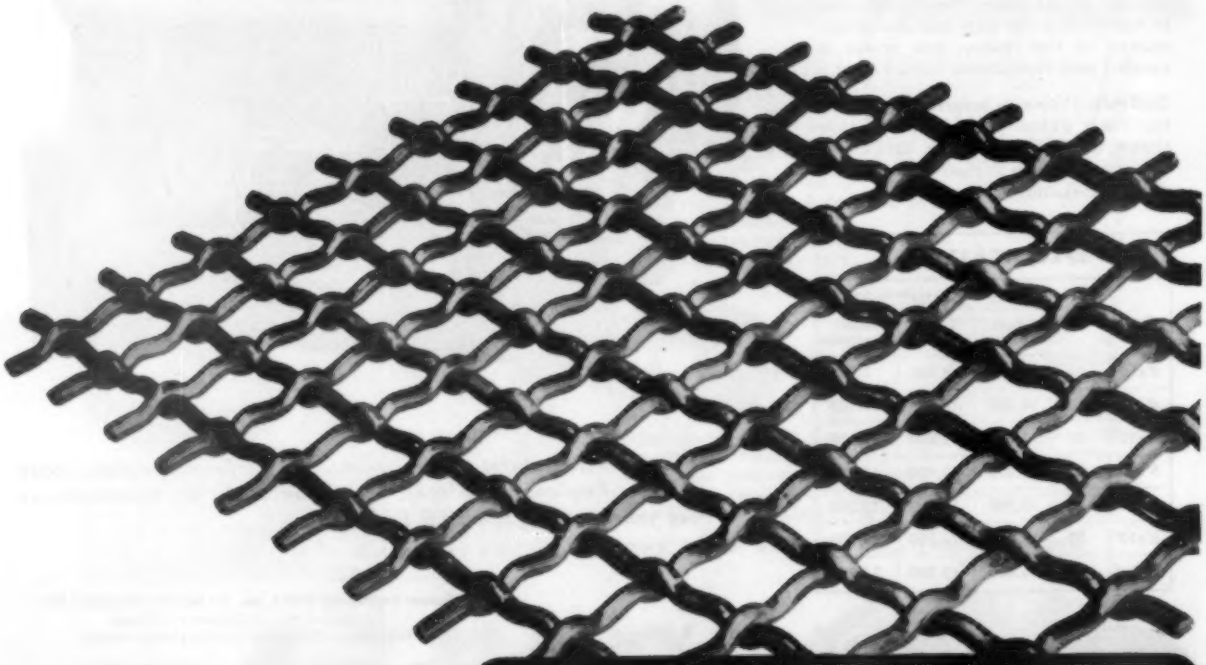
PRECISION

mean to you?

To us it means space screens that are built as tools of production.

- **Made from wire that is crimped to precision standards.**
- **Then woven extra tightly to maintain accurate, uniform spacing under the severest conditions.**
- **Results in *precision* openings that will maintain their accuracy under the severest vibration.**

Let us show you how Super-Tempered Precision Space Screens mean greater tonnage output per screen dollar.



SUPER-TEMPERED
PRECISION SPACE SCREENS
PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

CF&I

THE COLORADO FUEL AND IRON CORPORATION—Denver and Oakland
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2468

Get a Bonus in Every Bucket!

——— *with a* MICHIGAN

Notice two facts about this operation:

1 More than 3 yards in that 2¼ yard capacity bucket—a 100% bonus load!

The independent bucket control on MICHIGAN tractor shovels makes this kind of performance possible. Two powerful double-acting cylinders on the MICHIGAN bucket provide tremendous break-out power, enable the operator to "work" the bucket while it's buried deep in the pile. His bucket-control lever *over-rides* the boom-hoist, so he doesn't have to lift the bucket out of the pile *until* he's got a heaping bonus-load.

2 All wheels solidly on the ground!

Here's proof of the MICHIGAN'S bonus margin of weight distribution. These are the heaviest, most powerful tractor shovels on the market today. Even with a 100% bonus bucket load, you still have complete stability and traction.

One brief demonstration will convince you quickly that you'll get a Bonus Bucket every time with a MICHIGAN Tractor Shovel—for more yardage moved, in fastest time, at lowest cost. Such a test is easy to arrange—simply call your nearby MICHIGAN distributor; or use the coupon. MICHIGAN Tractor Shovels are available under the Clark leasing Plan—we'll be glad to send you details.

CLARK EQUIPMENT

CLARK EQUIPMENT COMPANY
Construction Machinery Division
450 Second Street
Benton Harbor, Michigan

23

What's this about demonstrating the MICHIGAN Tractor Shovel?

Also, send us ☐ Specifications . . . and ☐ Lease Plan data sheet

Name_____

Firm_____ Title_____

Address_____

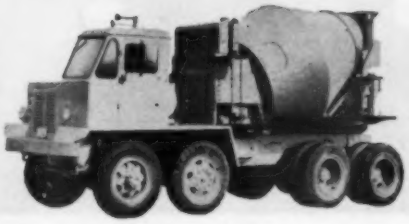
City_____ County_____ State_____

MODEL 20-S

20-ton end dump truck—120" wheelbase. Powered by 225 HP Diesel Engine with or without torque converter. 70,000 lb. Dart planetary rear axle with 20" x 9" air brakes—20,000 lb. front axle with 17¼" x 4" air brakes—14:00 x 24, 20-ply front tires—16:00 x 24, 24-ply rear tires. Hydraulic steering—13 cubic yard R/O body. Approximate weight, 35,000 lbs.

MODEL 300/747—45-ton crane carrier—220" wheelbase. Powered by 200 to 250 HP Gasoline or Diesel Engine with 5-speed transmission and 2-speed auxiliary transmission. 25,000 lb. front axle with 20¼" x 5" air brakes—90,000 lb. tandem rear axles with 20¼" x 7" air brakes—(10) 14:00 x 24, 20-ply tires all around. Hydraulic steering. Approximate weight of chassis, 50,000 lbs. Other models available.

MODEL 15DT—Chassis for 7-7½ cubic yard mixer—138" wheelbase. Powered by 165 HP Gasoline Engine with 5-speed transmission and 3-speed auxiliary transmission. 22,000 lb. tandem front axles with 17¼" x 3" air brakes—28,000 lb. tandem rear axles with 16" x 5½" air brakes—(12) 10:00 x 22, 12-ply tires all around. Approximate weight of chassis, 14,000 lbs.



MODEL 55TA—55-ton end dump truck—211" wheelbase. Powered by two 300 HP Diesel Engines with torque converters. 200,000 lb. Dart planetary drive tandem rear axles with 20" x 9" air brakes—50,000 lb. front axle suspended with a hydraulic air strut with 20" x 9" air brakes. Steering by hydraulic power on a center bearing cushioned by captive air in hydraulic air strut. 18:00 x 25, 32-ply tires all around—30 cubic yard rock body. Approximate weight, 96,000 lbs.

MODEL 10-S—10-ton end dump—106" wheelbase. Powered by 156 HP Diesel Engine—14,000 lb. front axle with 17¼" x 3" air brakes—26,000 lb. full floating double reduction rear axle with 16½" x 7" air brakes—12:00 x 20, 16-ply tires all around. Hydraulic steering—6½ cubic yard R/O body. Approximate weight, 20,000 lbs.

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Kansas City 8, Missouri

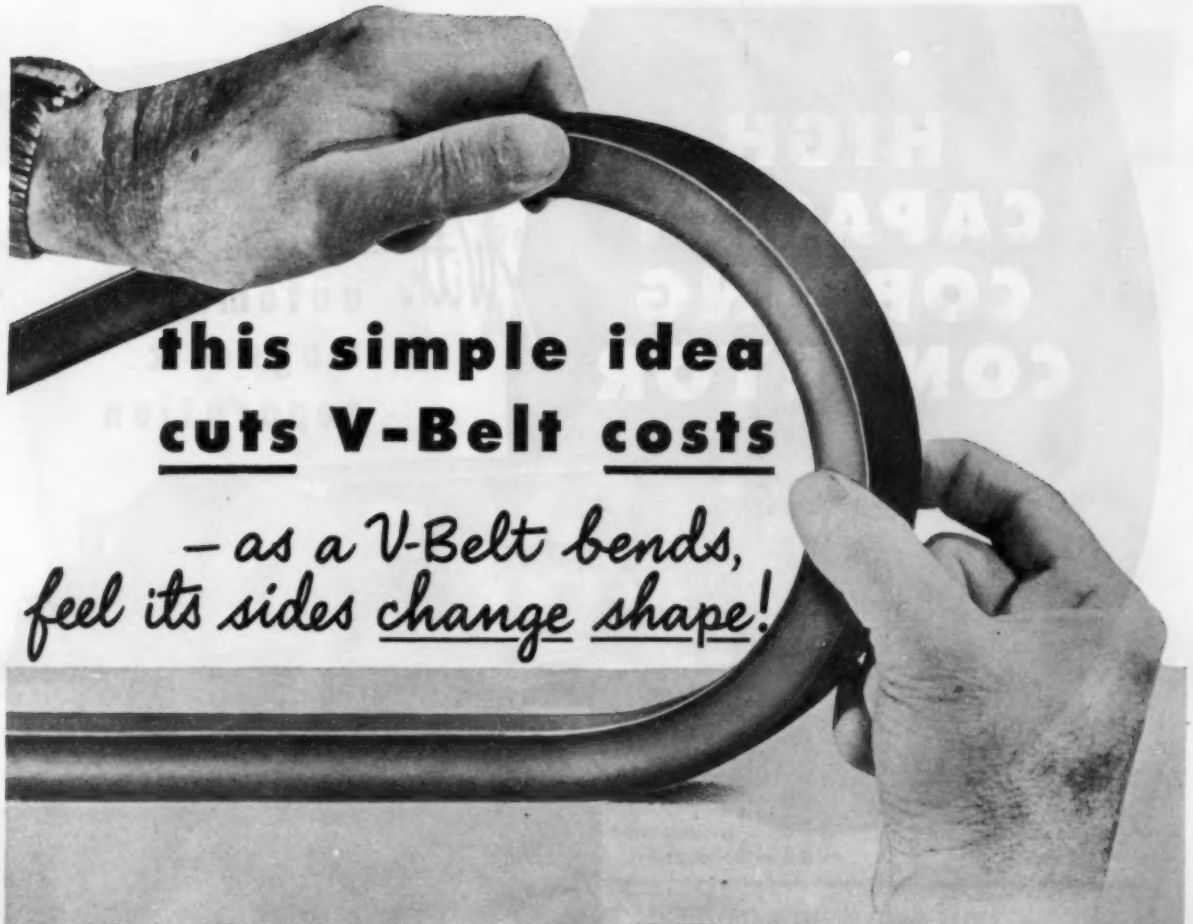
SUBSIDIARY OF THE CARLISLE CORPORATION

MODEL 30-SL—30-ton end dump truck. Full cab. 184" wheelbase. Powered by 300 to 350 HP Diesel Engine with or without torque converter. 100,000 lb. Dart planetary rear axle with 20" x 9" air brakes. 25,000 lb. front axle with 20¼" x 5" air brakes. 14:00 x 24, 28-ply front tires (16:00 x 25, 24-ply optional)—18:00 x 25, 32-ply rear tires. Hydraulic steering—20 cubic yard Rock body. Approximate weight, 46,000 lbs.

MODEL 35SA—35-ton end dump truck—169" wheelbase. Powered by 300 to 400 HP Diesel Engine with Torque converter. 100,000 lb. Dart planetary rear axle with 20" x 9" air brakes—50,000 lb. front axle suspended with a hydraulic air strut with 20" x 9" air brakes. Steering by hydraulic power on a center bearing cushioned by captive air in hydraulic air strut. 18:00 x 25, 32-ply tires all around—24 cubic yard Rock body. Approximate weight, 52,000 lbs.

MODEL 15S-BDT—15 cubic yard bottom dump truck—100" wheelbase (tractor). 70,000 lb. Dart trailer axle with 20" x 9" air brakes. Hydraulic or cable operated doors. Front tires, 13:00 x 24. Rear tractor and trailer tires, 24:00 x 25. Approximate weight of tractor-trailer, 40,000 lbs.

MODEL 200/456—25-ton crane carrier—184" wheelbase. Powered by 130 to 200 HP Gasoline or Diesel Engines with 5-speed transmission and 2-speed auxiliary transmission. 14,000 lb. front axle with (optional) 17¼" x 3" air brakes. 50,000 lb. tandem rear axles with 16½" x 7" air brakes. (10) 11:00 x 20, 12-ply tires all around. Hydraulic steering (optional). Approximate weight of chassis 26,500 lbs. Other models available.



this simple idea cuts V-Belt costs

— as a V-Belt bends, feel its sides change shape!

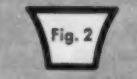
Pick up *any* V-Belt that has straight sides (Fig. 1) and bend it as if it were going around a pulley. At the same time, *grip its sides* with your fingers! You will feel the sides *bulge out* as in Fig. 1-A. Clearly, the bulging belt is forced to press *unevenly* against the V-pulley—and this concentrates wear at the points shown by arrows (Fig. 1-A).

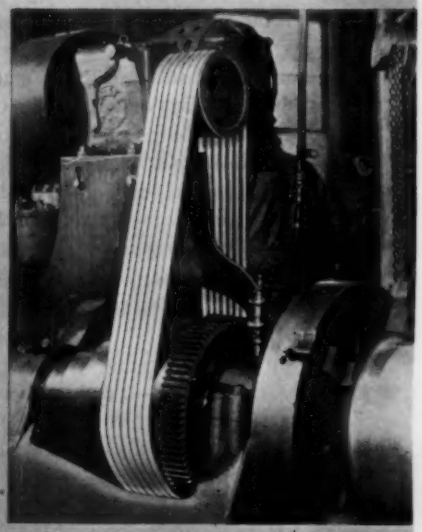
Now bend the belt with CONCAVE SIDES

(U.S. PAT. 1813698)

. . . the GATES VULCO ROPE (Fig. 2)

Instead of *bulging*, the precisely engineered CONCAVE SIDES merely *fill out* and become perfectly straight. This belt, when bent, *precisely fits* its sheave groove (Fig. 2-A). The sides press *evenly* against the V-pulley. Therefore, wear is distributed *uniformly* across the full width of the Gates Vulco Rope—and this means longer belt life and *lower belt costs* for you!





Typical Gates Vulco Rope Drive—the Gates V-belts are built with Concave Sides to insure longer belt wear.

When you buy V-belts, be sure to get the V-belt with the CONCAVE SIDES — the Gates Vulco Rope!

VULCO ROPE

Gates DRIVES

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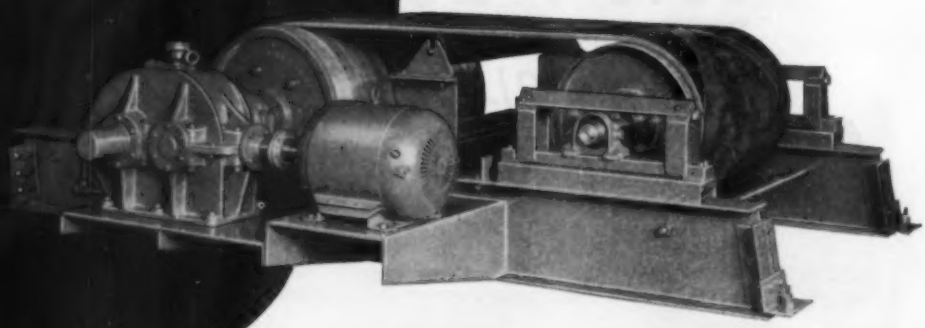
With automatic magnetic separation



Purification and concentration of metallic ores or non-metallic minerals is being accomplished successfully in many plants of large producers, with Homer Unit Type Magnetic Cobbing Conveyors. Large capacities, as in the operation illustrated at right, are handled at peak production levels—because the Homer Hercules Magnetic Pulley in the unit is *Permanently* magnetized. Down-time and production losses caused by loss of magnetism are eliminated.

If you have a magnetic separation problem in your plant—it will pay you to investigate Homer Permanent Magnetic Equipment. Write or phone—a competent representative is at your service.

Photo above shows a 30" x 42" Homer Magnetic Unit Type conveyor cobbing a mixture of iron ore and rock. This unit is handling 110 net tons/hr., at a belt speed of 300 ft./min. Iron ore content is approximately 40%, with rock sizes from 3" to 6" down to fines.

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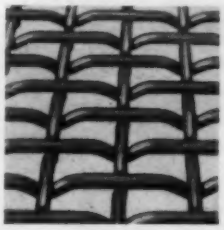
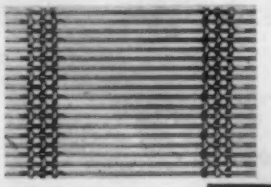
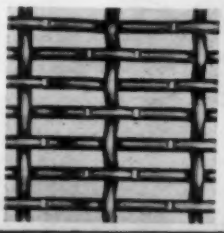
SMOOTHTOP Wire Cloth provides more wearing surface than any other type of construction.



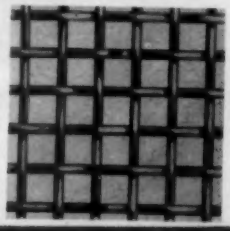
LONGSLOT Wire Cloth has a maximum amount of open area for high production — accelerated screening and non-blinding action.



OBLONG SPACE Wire Cloth increases open area and reduces clogging over square opening screens.



DOUBLE CRIMP Wire Cloth has extra rigid construction and accurate sized openings. Used mostly in smaller than 1″ openings.



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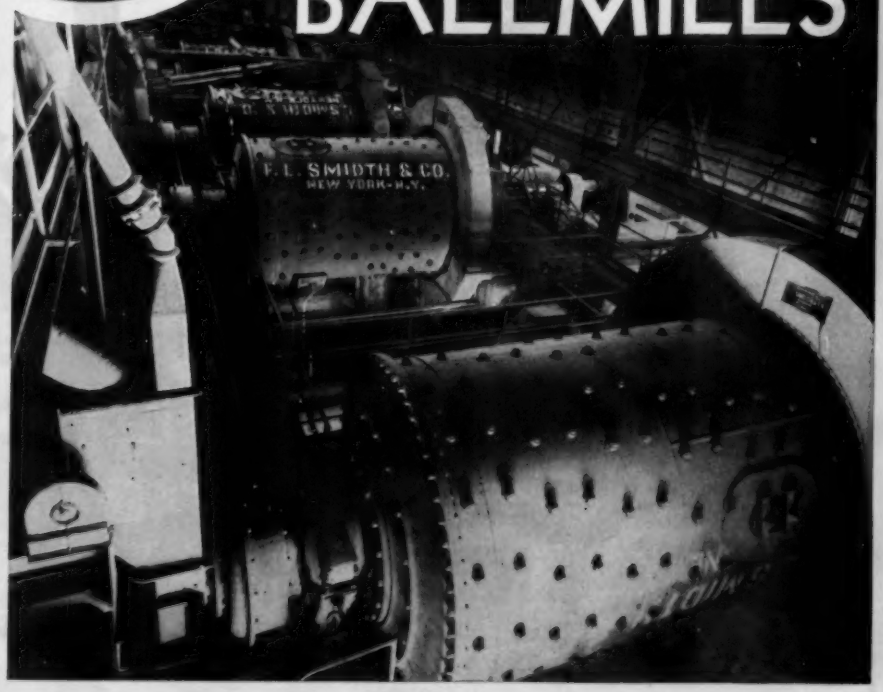

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ONE—you've got a maneuverable 600 cfm. Power Vane Rotary Compressor for a completely dependable air supply. Its oil injection system provides copious lubrication during off-level operation, yet oil consumption is low. A variable speed capacity regulator helps prolong engine life and reduce wear and tear.

TWO—you've got a rugged pair of CP Drill Arms. Both booms are readily adjustable to any drilling position... vertical adjustments are made by a rotary air motor... lateral adjustments are rigidly held by air-actuated post locks. Automatic safety locks prevent boom arms from settling.

THREE—***and to top it all off,*** mounted on the drill arms you've got two tubular CP drill carriages that provide all the rigidity and strength necessary to stabilize and feed the two hard hitting, strong rotating CP-70NDC Drifters. Write for details.

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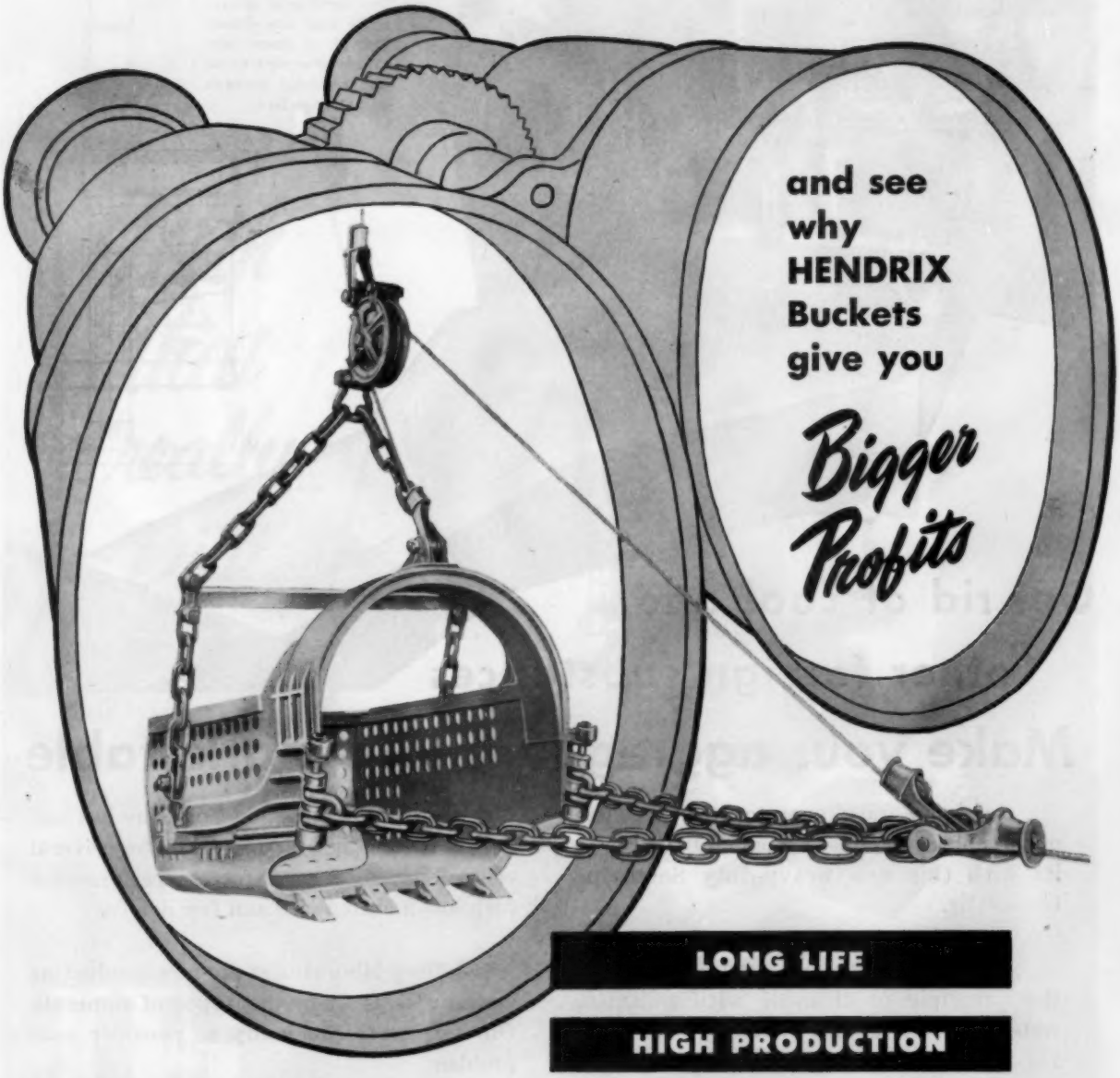
take a *closer* look



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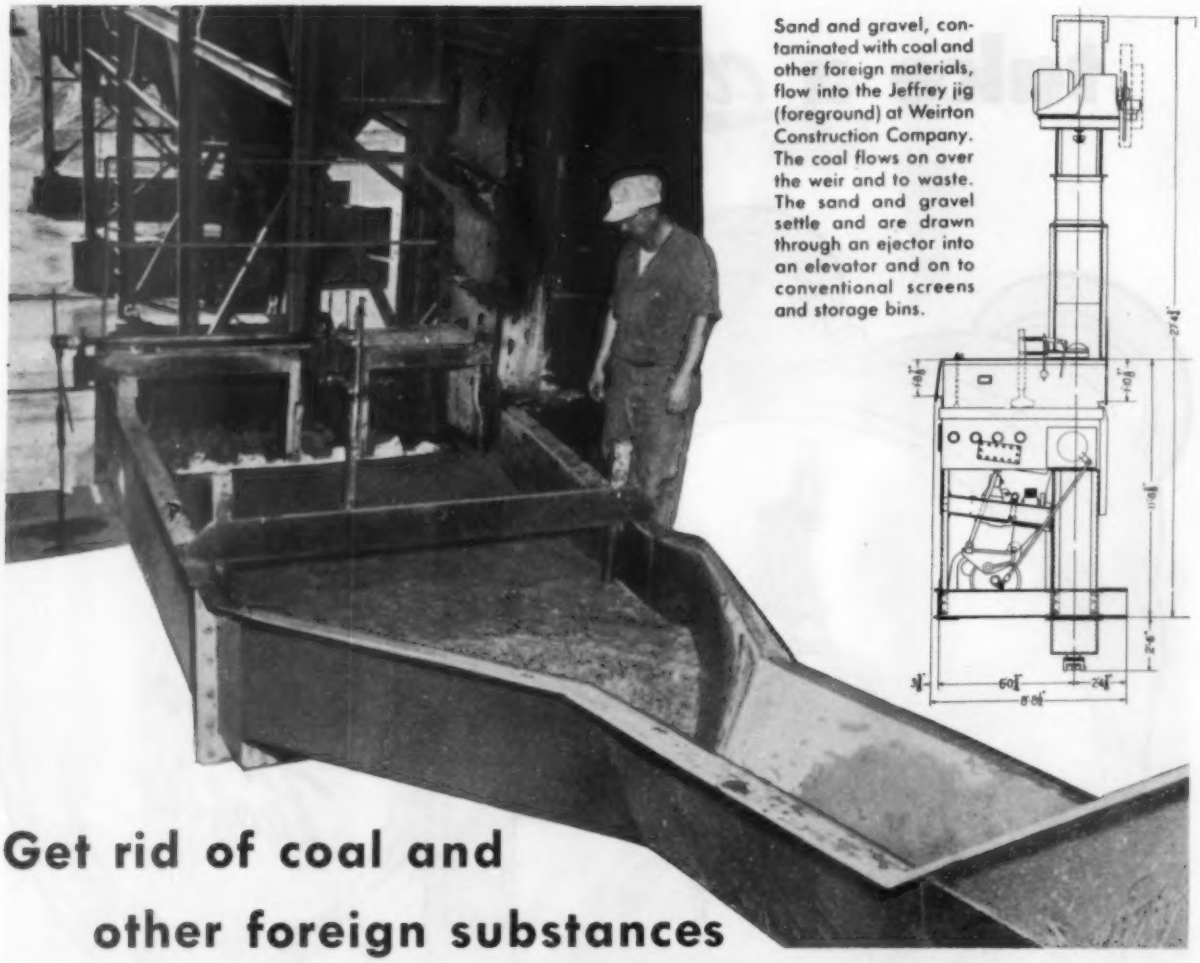

Sand and gravel, contaminated with coal and other foreign materials, flow into the Jeffrey jig (foreground) at Weirton Construction Company. The coal flows on over the weir and to waste. The sand and gravel settle and are drawn through an ejector into an elevator and on to conventional screens and storage bins.

Get rid of coal and other foreign substances

Make your aggregate more marketable

Sand and gravel operators have a golden opportunity to increase production and profits with this *new* heavy-duty Sand and Gravel Jig.

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The chrome ore known as chromite or chromic iron, used by General Refractories Company of Curtis Bay, Maryland, in the manufacture of fire brick for steel furnaces, comes from mines in remote sections of the Philippine Islands. Weighing approximately 220 lbs. per cubic foot, it is almost as heavy as lead ore. Yet a BAY CITY Model 45 Crane handles this ore, one of the world's heaviest, with relative ease. This powerful, efficient machine, operating with an Owens "M" bucket, unloads and stockpiles chromite for General Refractories Company at an exceedingly fast rate.

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Write for any of these catalogs describing BAY CITY *Crawlers of ½ yards and up or* BAY CITY *CraneMobiles and CraneWagons in capacities to 25 tons.*

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JANUARY 1955

THE CONCRETE MANUFACTURER

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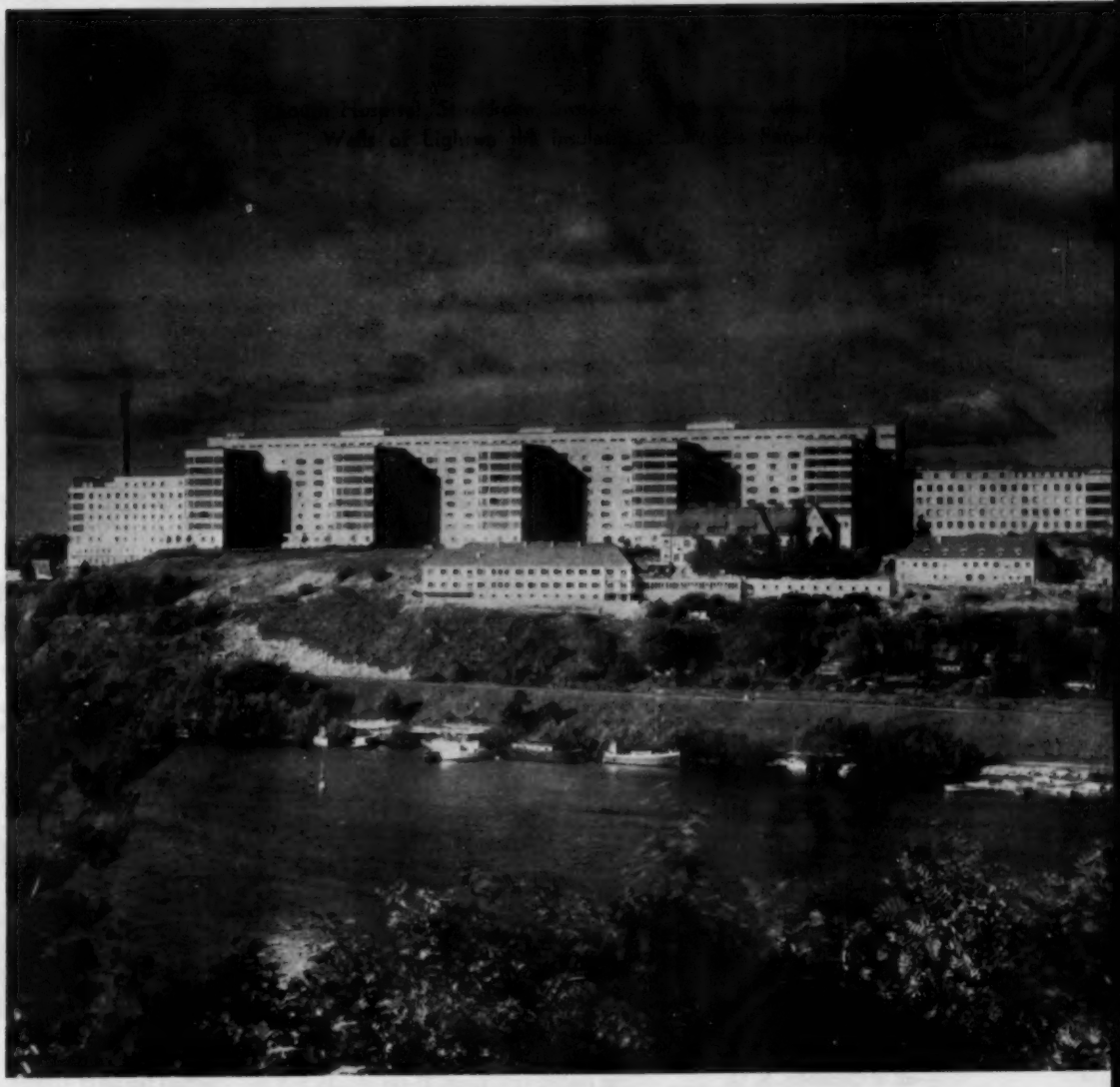
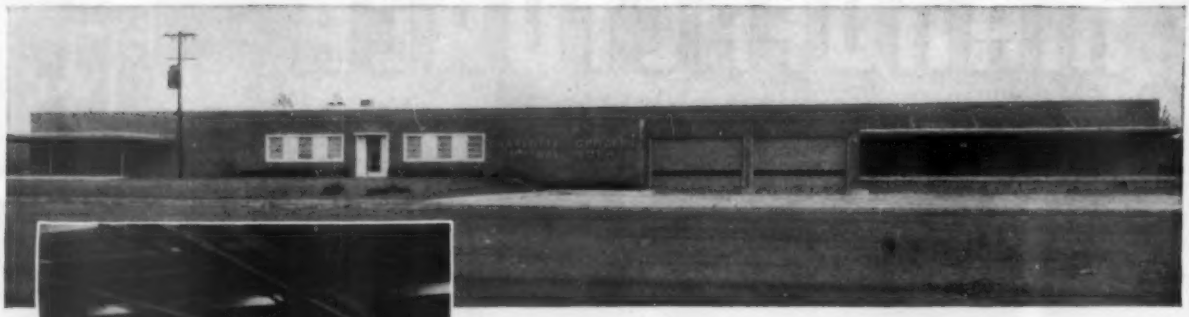
Ready-Mix Concrete



Concrete Prefabrication Pays



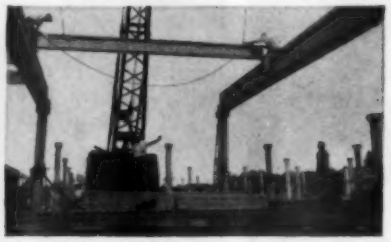
Charlotte Grocers Mutual Warehouse, 60,000 sq. ft. floor area, in "Acres for Industry" development, ten minutes from center of Charlotte, N. C.

Concrete prefabrication is growing by leaps and bounds, thanks to the economies of prestressed concrete members. This well-designed warehouse has precast girders, purlins and roof planks, all prestressed, as well as precast columns, fabricated at assembly-line speed with 'Incor'* 24-Hour Cement.

Designed for the material and method, prefabrication resulted in lowest construction cost, for a structure embodying utmost fire-safety and durability, with minimum insurance rates and lowest upkeep. Advantages well worth considering. *Reg. U. S. Pat. Off.

'Incor' concrete columns, 14" x 14", with 20" x 20" capitals, were precast at job site. Poured in morning, stripped in afternoon—48 columns produced in 12 days.

42 prestressed 'Incor' girders, each 45' long, 30" deep, top flange 12" wide, bottom flange 20" wide, web 5" thick, were cured and stripped in less than 24 hours.



Precast, prestressed 'Incor' concrete purlins, I-shape, 8" wide top and bottom flanges, 3" web, 18" deep, 24' in length, with angles for welding to girders and columns.

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"Acres for Industry"
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Total of 60,000 sq. ft. precast roof planks, each 1¾" x 18" x 18 ft., were pretensioned at the casting plant. These planks butt together and have recesses for grouting.

At pretensioning bench, 'Incor' concrete produced stripping strengths in 18-24 hours, setting tempo of assembly-line operation as basis of substantial production economy.

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The CONCRETE MANUFACTURER

January 1955

1954, A Record Year for Concrete Manufacturers

THE concrete block, ready-mixed concrete, concrete pipe and other concrete manufacturing industries, individually and collectively, set new record highs of production in 1954. According to the best available information at this time concrete block production was up about 5 percent to 1,900,000,000 (standard 8- by 8- by 16-in. equivalent) units; ready-mix output was up about 6 percent to 61,500,000 cu. yd., and concrete pipe was up about 5 percent to 12,300,000 tons. The above figures are at best estimates as most of them are based on 1947 census figures which are the latest official data available. Each year we have sent out questionnaires to these industries, this year several thousand, and have based our estimates on the answers to them. Each year the answers have shown increases in production both over the preceding year and from the 1947 base.

It is difficult to be anything else but optimistic over the prospects for these industries in 1955. The general business and industrial picture is brighter and the slight drop in volume in the past year is expected to be regained. Authorities on construction predict another record year but, as most of the increase is to be in highway construction, this will probably help the concrete building units manufacturers less than it will the ready-mixed concrete and concrete pipe industries. Each of these three industries should see another record year in 1955.

Cement supply was not a serious problem in any major producing area during 1954, according to the surveys made of the concrete block, ready-mixed concrete and concrete pipe industries for the reviews in this issue of the CONCRETE MANUFACTURER, and the survey of the cement industry for the review of that industry in the January, 1955, issue of PIT AND QUARRY. The cement industry should be given full credit for another outstanding achievement in 1954 as it increased its capacity materially for the eighth consecutive year in order to keep up with the swelling demand. In 1953 the industry apparently caught up with the demand and in 1954 at least kept abreast of it. Two new cement plants went into operation during the year and at least 17 other plants completed major expansion programs which added considerably to their capacity. Dozens of other plants made less extensive improvements, many of which also added to capacity. We estimate that the actual amount of new capacity installed must have been at least 12,000,000 bbl. annually. Allowing for the old capacity replaced, this means about 5,000,000 bbl. or over 2 percent of actual capacity increase for the industry.

Those in the concrete manufacturing industries who are concerned over the effect the accelerated highway building programs will have on cement supply by late 1955 and in 1956 will be happy to learn that the cement industry has taken this into consideration in making plans for 1955 expansion. According to information now at hand the cement industry will in the coming year add considerably more capacity than in any year since the World War II and perhaps more than in any other year. There are known to be four new plants either under construction or definitely to be started on soon; at least 24 other plants have major expansion programs in the same category, and there are again dozens of minor programs. These known programs add up to over 25,000,000 bbl. of cement producing capacity of which at least 12,000,000 bbl. will be new capacity, with at least 8,000,000 bbl. becoming effective before the end of 1955.

Walter E. Trauffer

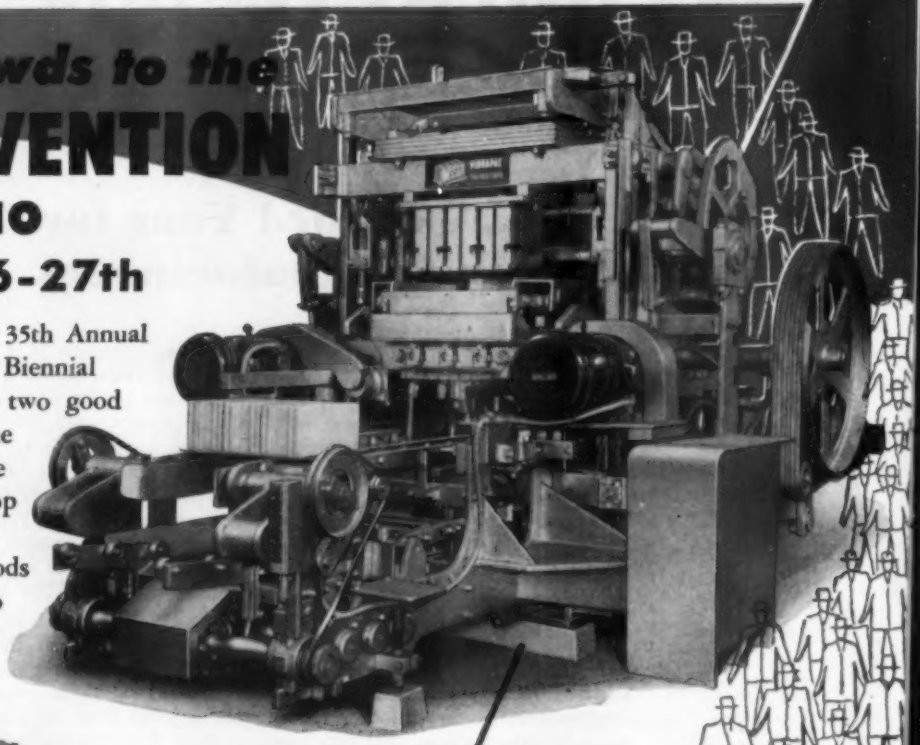
BESSER Leads the Parade

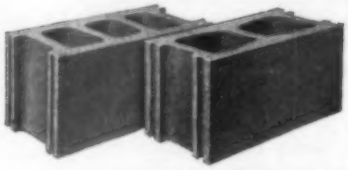
Follow the Crowds to the NCMA CONVENTION

CLEVELAND, OHIO

January 24-25-26-27th

Again Cleveland beckons you! The 35th Annual Meeting of the NCMA and the 9th Biennial Concrete Industries Exposition are two good reasons why you should head for the big city on Lake Erie. You'll have the opportunity to rub shoulders with top men in the Industry . . . to learn of new processes and production methods . . . and above all, to discover how to make PREMIUM Block, FASTER and more PROFITABLY.





VISIT THE BESSER EXHIBIT — In addition to a variety of equipment for block plants, Besser will have a beautiful pictorial display, in natural colors, showing the tremendous advance and acceptance of block for all types of buildings. You will be amazed at the beautiful architectural effects that can be achieved with modern masonry units . . . all made on a VIBRAPAC, using ONE set of Plain Pallets . . . *a principle originated by Besser.*

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BESSER SALES HELPS — Learn how Besser helps Vibrapac Plants sell more block by supplying them with necessary literature, movie films, radio script, newspaper ads, book matches, plan books, etc.

CLEVELAND PUBLIC AUDITORIUM — site for this year's Convention and Exposition. Plan now to attend the sessions and view the many worthwhile exhibits.

Join the NCMA

If you are not already a member of NCMA, we suggest you attend the Cleveland Convention and learn the advantages of belonging to this progressive Association.

BESSER COMPANY

BOX 131 • ALPENA, MICHIGAN, U. S. A.

Complete Equipment for Concrete Block Plants

news of the concrete industries

American-Marietta Co. Buys Controlling Interest Of Standard Lime & Stone

In a recent major expansion move, American-Marietta Company extended and again diversified its interests in the construction industry by acquiring control of the 74-year-old Standard Lime & Stone Company of Baltimore, Md.

Standard, which operates nine plants in seven states and employs 1,600 persons, is an important producer of portland cement, crushed limestone used by the steel industry, and chemical lime sold to chemical and paper manufacturers.

The company owns large tracts of high-quality limestone deposits throughout Maryland, Virginia, West Virginia, Pennsylvania, Ohio, and Illinois. Estimates indicate that present limestone reserves are sufficient for 50 years of operation at current levels.

The all-cash transaction, involving more than $10,000,000, was handled by funds provided through bank credits, private placement of preferred shares, and the recent sale of below-average income-producing properties, as well as from American-Marietta's expansion reserves.

Sales of Standard for the last several years have averaged nearly three times those of a decade ago. Anticipated net income of the new subsidiary is well above that required by American-Marietta's expansion formula, which provides immediate opportunities for established shares and a potential for further growth out of retained earnings.

With assets in excess of $18,000,000, future operations will be conducted by executive management officials who have been with Standard for many years. Through the foresight of this group who have been with the company during its greatest growth period, Standard will continue to benefit from favorable depreciation and depletion rates and from the accelerated amortization program which became effective during recent years. Since 1950, more than $5,000,000 of capital expenditures have been financed from these sources alone.

Grover M. Hermann, board chairman, and Robert E. Pflaumer, president of American-Marietta, have stated that an expansion program for Standard will be launched immediately and that plans include increasing cement capacity by approximately 750,000 barrels annually.

American-Marietta, a leading manufacturer of paints, resins, metal powders, household products, and materials used for building and highway construction, entered the precast concrete field in 1953 and is now considered the nation's largest producer of concrete pipe for sewers and drainage. Sales of American-Marietta Company last year were in excess of $100,000,000.

Coming Events

January 9-13, 1955—Miami. 25th annual convention, National Ready Mixed Concrete Association. Miami Municipal Auditorium.

January 12 and 13, 1955—Milwaukee. 35th annual convention, Wisconsin Concrete Products Association. Plankinton Hotel.

January 17-19, 1955—Niagara Falls, Ont. Annual convention, National Concrete Products Association (Canadian). Sheraton-Brock Hotel.

January 24-27, 1955—Cleveland. 35th annual convention, National Concrete Masonry Association. Cleveland Public Auditorium.

January 30-February 2, 1955—St. Louis. Fifth annual convention and show, Mason Contractors Association of America. Jefferson Hotel.

February 1-3, 1955—Dayton. Second annual convention, Ohio Concrete Block Association, Inc. Dayton Biltmore Hotel.

February 21-24, 1955—Milwaukee. 51st annual convention, American Concrete Institute. Hotel Schroeder.

March 9-12, 1955—Boston. 47th annual convention and meeting, American Concrete Pipe Association. Sheraton-Plaza Hotel.

Walter E. Corbett, 66, a former president of the American Concrete Pipe Association, died recently in his home in Massachusetts.

C. R. Wilhelm of Universal Concrete Pipe Company, Atlanta, Ga., was elected president of the Southeastern Concrete Pipe Association at the seventh annual meeting of the organization, held recently at Charleston, S. C.

A.C.A.P.A. St. Paul Meeting Combines Short Course With Regional Session

On December 3 and 4 a short course in concrete was held on the St. Paul campus of the University of Minnesota. This event which was also a regional meeting, was sponsored by the university in cooperation with the American Concrete Agricultural Pipe Association. About 85 manufacturers were present.

Gradation of aggregates and proper curing were explored in great detail. Samples of quality concrete drain tile properly manufactured were tested to failure along side of improperly manufactured samples. After a visual inspection of both the properly and improperly made samples, those present expressed by secret ballot their estimate of the supporting strength of each sample. The prizes, maximum thermometers for use in curing bins, went to John Waite, Waukesha Cement Tile Company of Waukesha, Wis., and George Lillie, Platte Valleye Cement Tile Mfg. Company, Scottsbluff, Nebr. Howard F. Peckworth, A.C.I., managing director, spoke on research needs of the industry.

This interesting short course, designed to enable small independent segments of small business enterprise to tap sources of education in their manufacturing processes unavailable by any other means, was planned by the following: P. W. Manson, professor, department of agricultural engineering; Dalton G. Miller, professor emeritus; and Howard F. Peckworth.

The executive committee of the American Concrete Agricultural Pipe Association also held its semi-annual meeting on December 2.

W. E. Anderson, Pioneer In Ready-Mix, Dies in Florida

W. E. Anderson, a pioneer in the ready-mixed concrete industry and a member of the Ohio Ready Mixed Concrete Association, died recently at his home in Lake Wales, Fla., after a brief illness.

Mr. Anderson was one of those who early recognized the feasibility of mixing concrete in transit. He founded the ready-mixed concrete firm of W. E. Anderson Sons Company in Columbus, and was active in its management for many years. This firm was later renamed the Anderson Concrete Corporation; it is now operated by Ralph Anderson, his son.

R/ Ready Mix

By Harry F. Thomson

Concrete "Facts of Life" Misunderstood

IT is obvious that a progressive ready-mix producer should know the basic characteristic of concrete. In a small company the concrete specialist may be the proprietor or head of the organization; in a sizable company the staff may include at least one man with special training or experience with concrete. Such specialized knowledge within a ready-mix organization appears good business for three reasons: first, to insure that the company furnishes quality concrete; second, to be able to advise the company's customers on any unusual problems pertaining to concrete; and third, to offer the local community the benefits of up-to-date practices on concrete and its use in construction.

That the concrete industry as a whole is sincerely interested in furnishing quality concrete and intelligent service is attested by the growing interest in "short courses", such as the one offered annually by the National Ready Mixed Concrete Association in co-operation with the University of Maryland, and the large number of courses being presented at regional meetings of producers. It may be noted in passing that the applications for the recent N.R.M.C.A. course at Washington exceeded the seating capacity of the available classroom space.

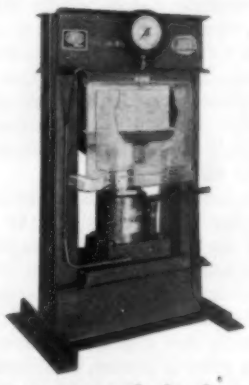
Such interest on the part of progressive producers is a healthy sign. It indicates the industry's recognition of an obligation to the building public—as well as the desire of individual producers to have their personnel better trained than the personnel of competitors. However, it is distressing to note the number of ready-mix producers—some large, many small—who make no apparent effort to be fully conversant with the basic characteristics of concrete. Some appear content to follow blindly a weigh schedule which they have obtained from a public-works inspector or possibly a cement company service man. To them, ready-mix represents merely an alternate method of delivering cement, sand and aggregate, at possibly a wider mark-up than for the equivalent quantities of dry materials. They have not recognized that the production of ready-mix is a manufacturing operation which offers the opportunities as well as the obligations of a specialized product. It is to be hoped that the already small proportion of such backward operators—who are really riding on the reputations of the well-informed producers—will decline rapidly.

An unfamiliarity with the basic characteristics of concrete is found occasionally among architects, engineers, and even contractors, and the onus of this shortcoming falls too frequently on the ready-mixed concrete producer. The fact that the rate of developing strength depends largely on temperature is too often disregarded. A situation which may cause trouble for the producer can result from misinterpreting short-time compression tests. If the test is intended to measure the quality of the concrete as delivered, it should be conducted in accordance with A.S.T.M. standard procedure. This standard provides that the specimen be stored at substantially normal temperature for the first 24 hours and then be removed to the laboratory for curing under standard conditions of approximately 70 deg. F. temperature and 100 percent humidity.

If there is delay beyond the first day in delivering the specimen to the laboratory, the strength shown in an early-age test, say seven days, may be considerably below what it would have been if properly placed under laboratory conditions. When the contractor or architect sees a low test on a laboratory seven-day report, he may erroneously conclude that the quality of the concrete was below par, and the ready-mix producer receives a complaint. The producer may have difficulty in persuading the complainant that a test under such conditions is not a recognized test, and that the strength reported is no real measure of the quality of the concrete. Such embarrassing situations would be avoided if recipients of test reports understood and correctly interpreted the significance of low temperature and delay in reaching laboratory conditions, upon the strength of the specimen. (Note—The importance of laboratory reports containing complete information on the history of each cylinder will be discussed in a subsequent article in this column.)

An unfortunate experience may be cited as typifying possible extra expense resulting from an inadequate understanding of the influence of low temperature on development of strength of concrete. The job was a large multi-story building designed by a prominent architect. The foundation was composed of clusters of poured-in-place concrete piles. The piles were poured during the winter months when the temperature was well below freezing; heated ready-mix was used. Considerable straw was thrown around the exposed pile ends, but this was disturbed by workmen walking around the excavation, so that many ends became practically bare. When the pile contractor was

Jones COMPRESSION TESTING MACHINE



for more economical mixes, and uniformly higher strength

By doing your own testing of concrete blocks and cylinders, you will immediately discover anything which may have gone wrong with the aggregate, grading, mixing, etc. This will help you maintain more uniform quality and develop more economical mixes. The Jones (formerly Yoder) testing machine is low in first cost, specially designed for concrete products plants.

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This Y-260 is *built* for 26,000 lbs. (at 36 inches)—not just beefed-up. It's as easy to drive as a truck half its size; power steering and power brakes are standard. And a brake selection switch enables the driver to apply brakes to *either* drive wheel, when one wheel has lost traction in slippery grounds. Maintenance access is excellent, wrap-around counterweight has minimum over-hang, operator visibility is outstanding. In general, *this lift truck is a beautiful brute!*

For big jobs, you'll want more details on the Y-260. Call your local Clark dealer, listed in the Yellow Pages under "Trucks, Industrial," or send the coupon.

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preparing to remove the driving rig, the general contractor began preparations for pouring the pile caps. Laborers cleared away around the clusters of piles, and began cutting off the shells extending above ground.

It was then noted that the concrete in some of the shells above ground (which had been poured from four to six weeks previously) did not have the desired 3,000 lb. strength. The architect then stepped in, criticized the concrete as unsatisfactory, and shut down work on the pile caps. In order to check on the strength of concrete lower in the piles, four-foot length below grade were cut from two piles; these were sawed into 1 ft. pieces in a commercial laboratoy and from each piece a 6-in. cube was cut. The top cubes were placed in the laboratory curing room, and after two weeks showed compressive strength well over 3,000 p.s.i. The second, third, and fourth cubes, without curing, were tested for compressive strength, and showed approximately 2,000, 2,400, and 2,800 p.s.i., respectively.

The consensus of the manager of the pile company, the service manager of a cement manufacturer (not the brand used in the piles), and the consultant for the ready-mix producer was: (1) that the portion of the piles near the ground level had been chilled, which resulted in lower than normal strength for the age since being poured; (2) that the ready-mix as furnished was up to specification; and (3) that the piles would be o.k. clear to the top after exposure to normal temperatures. However, the architect was still not satisfied and required the pile company to drive additional piles at a substantial extra expense, not to mention delay, to the project. The experienced concrete men concerned were of the opinion that the architect had made an incorrect decision through failing to recognize the delaying effect of low temperature on development of strength.

Such instances of either lack of knowledge of the hardening characteristics of concrete or obtuseness toward recognizing the performance of modern portland cement, are not common among architects and engineers, but they are disturbing when they do occur. There was a recent case of a leading architect whose specification for reinforced concrete required 6 sacks of cement per cubic yard, but called for strength of only 2,000 p.s.i. When it was pointed out that the 2,000 lb. could be obtained with less than 6 sacks and that money could be saved for the client by so specifying, the reply from the architect was that specification had produced good concrete for 25 years and he didn't propose to change it now, regardless of savings.

There has been widespread misconception among both specification writers and contractors regarding the performance of calcium chloride in cold weather, in spite of accurate statements from the manufacturers. Many appear to think that the addition of calcium chloride in normal proportion, commonly 2 percent of the weight of cement, will prevent freezing of the concrete. Actually the presence of the chloride accelerates the initial set of the cement, so that in most cases, by the time the mass has cooled to a temperature approaching freezing, the concrete has developed sufficient strength to withstand the damaging effect of expanding ice crystals. Disappointments sometime occur through failure on the job to furnish enough insulation to slow down the chilling effect of cold air sufficiently to give the chloride opportunity to accelerate initial hardening.

The foregoing cases are typical instances where a good understanding of the characteristics of concrete by supervisors, contractors, and ready-mix producers would result in the rational conclusions leading to better concrete construction.

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LEFT TO RIGHT: PAUL PAVISH, L. J. PAVISH, LEO PAVISH, JR.

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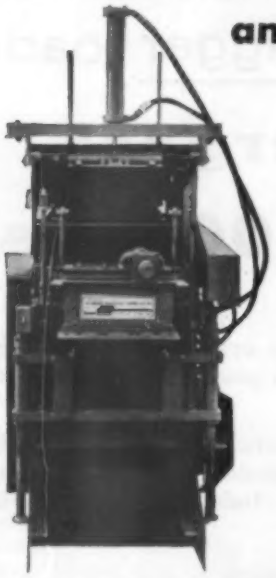

The men from Pavish wanted a machine that would give *performance* – efficient, economical, trouble-free performance, year after year. That's why they chose Fleming's FMC-180, for a smooth operation *at the touch of a button!* They wanted the 180 because it produces clean, sharp-edged blocks of different heights from plain pallets; because it eliminates the need for an extra man; because it vibrates under pressure; because of its efficient, economical hydraulic power plant. They obtained *all* these money-making features in the FMC-180 – and *you can too* – at a cost *far less* than any other comparable precision-engineered block machine on the market today!

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Gentlemen: Please rush complete information, including specifications, prices and terms on the low-priced, fully-automatic FMC-180 concrete block machine.

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Fifth Concrete Conference Scheduled for Jan. 19-21 At Oklahoma A and M

Plans are nearing completion for the fifth annual Concrete Conference at Oklahoma A and M College, Stillwater, on January 19, 20, and 21. Participating in this meeting are the School of Civil Engineering, Oklahoma Institute of Technology at Stillwater, the American Concrete Institute, the Portland Cement Association, the National Ready Mixed Concrete Association, Associated General Contractors of America, Inc., the American Institute of Architects, the National Sand and Gravel Association, the National Crushed Stone Association, and the National American Society of Civil Engineers. An attendance of more than 200 persons is expected.

R. P. Will and John W. Comer, both of the civil engineering faculty at Oklahoma A and M, will serve as director and assistant director, respectively.

It was announced that the program was designed to present discussion problems on quality controls, specifications, materials, products, design, and methods. There will also be a heavy-duty floor demonstration.

A.C.I. Announces Publication Of 1954 Book of Standards

Publication of the A.C.I. *Book of Standards — 1954* has been announced by the American Concrete Institute. The 270-page book is a compilation of current A.C.I. standards, practices, and specifications. It is available at $3.50 per copy from A.C.I. headquarters, 18263 W. McNichols Road, Detroit 19, Mich.

Among the topics covered are the following: building code requirements for reinforced concrete; recommended practice for the use of metal supports for reinforcement, for winter concreting methods, for selecting proportions for concrete, for measuring, mixing, and placing concrete, for the application of portland cement paint to concrete surfaces, for the construction of concrete farm silos, and for the application of mortar by pneumatic pressure; specifications for the design and construction of reinforced concrete chimneys, for concrete pavements and bases, and for cast stone; and minimum standard requirements for precast concrete floor units.

● Photographed during an informal conference at the recent meeting of the Unit Masonry Association of Oregon in Portland were S. Carl Smithwick, William P. Markert, and Frank Spangler. Mr. Markert, promotion director, National Concrete Masonry Association, Chicago, who addressed the group upon this occasion, praised the work of the local association in promoting unity and co-operation among all segments of the masonry industry, and predicted a fine year ahead in the construction field.

Zenith Concrete Products "Majors" in Prestressing

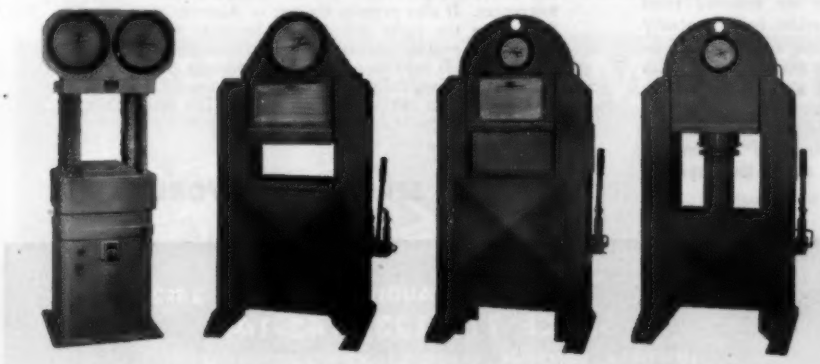
Zenith Concrete Products, West Duluth, Minn., has gone into production, turning out a wide variety of items including pre-cast bridge beams, blocks, and pilings.

According to D. C. McDonald, president, the plant eventually will have facilities for turning out all the concrete items for an entire home. Block for the firm's first large-scale job, a school building at Red Lake, Minn., was cured in 128-ft. autoclaves.

Beams for the company's new plant and other prestressed concrete members were naturally produced right at the original plant. Some of the beams are 55 ft. long and weigh 13 tons.

Mr. McDonald stated that his firm went into the concrete business mainly because prestressed members and high-pressure steam-cured block were becoming "musts" in the construction field. Zenith owns its gravel and aggregate pit.

Marble Face Blocks, Inc., Kenilworth, N.J., has granted a franchise for the local manufacture and sale of Marblox to Cinder Concrete Products, Inc., Kansas City, Mo. Marblox is the trade name for the 100 percent concrete building block with a smooth, shiny, colored concrete face, manufactured monolithically with the block. (See THE CONCRETE MANUFACTURER, May 1953.)



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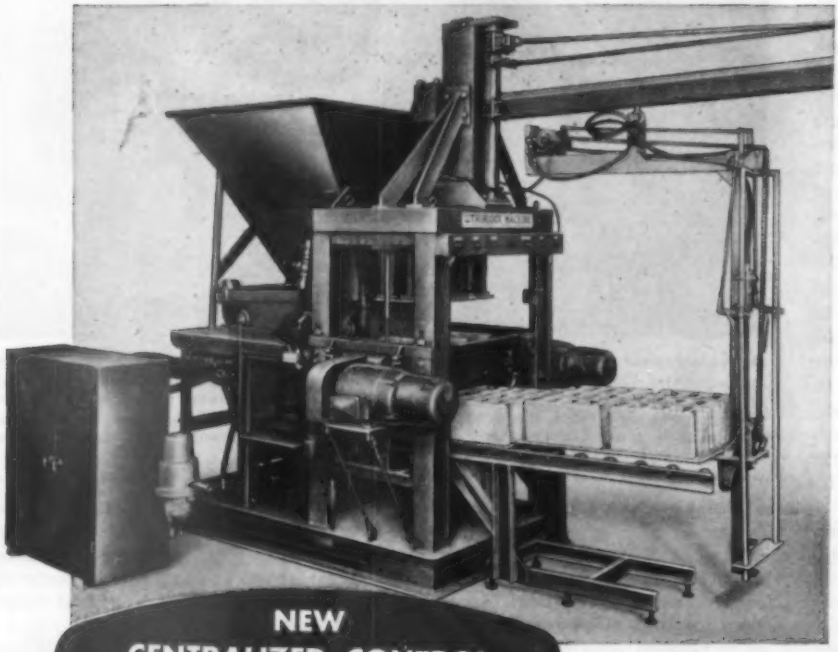
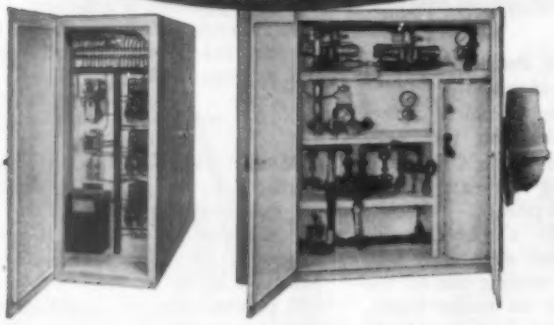


BRAND NEW FEATURES TO GIVE YOU SMOOTHER OPERATION AND EASIER MAINTENANCE

Through a program of constant refinement and improvement the makers of Lith-I-Block now offer plant operators the ideal machine to turn out highest quality block in big, low-cost volume.

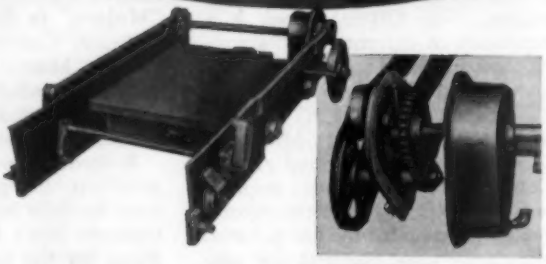
NEW CENTRALIZED CONTROL CABINET



ALL SENSITIVE CONTROLS REMOVED FROM DIRT AND VIBRATION TO ONE CENTRALIZED CONTROL CABINET

By placing all electric and pneumatic controls inside a single, fully enclosed, cabinet they are removed from grit, abrasive dust and vibration, besides being centrally located for convenient inspection and adjustment. Substantial savings in cycling time are made possible with this new, compact arrangement. It also eliminates the necessity for 8 valves and switches. A heating element is provided inside the cabinet so that all air valves operate in a warmed enclosure. Cleaning and maintenance of the machine is greatly simplified due to the improved accessibility.

NEW AGITATOR DRIVE



An all-new, dual eccentric, agitator drive which completely eliminates the need for shaker rods has been engineered into the redesigned feed drawer assembly. By placing the drive rods on the outside of the drawer, bearing shafts and pivot pins can be finished to much closer tolerances. It also permits the use of Alemite lubrication fittings on the eight self-aligning bearings which carry both thrust and radial loads in the drive assembly, so that friction loss is held to an absolute minimum. A new oil-bath chain drive, fully enclosed in a dirt-proof housing, greatly increases chain and sprocket life. The entire drive assembly can easily be removed intact from the drawer body without special tools.

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SPACE 119-123, 142-146
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greater than ever for 1955

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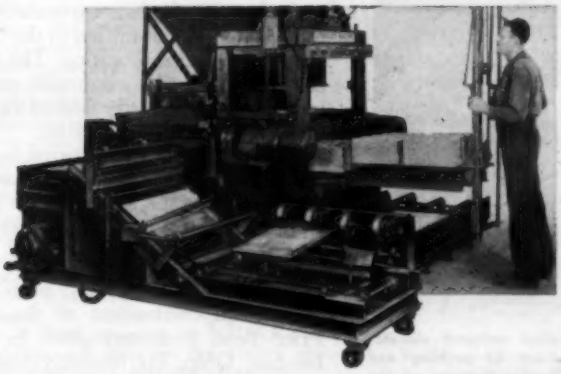


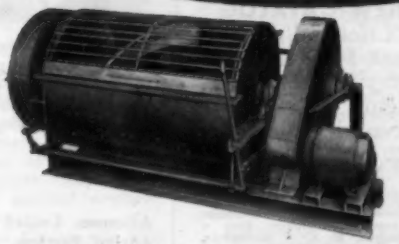
Fast, efficient, one-man operation is now possible through the use of this new Lith-I-Block automatic, front-loading, pallet return. As the green block is placed in the curing rack the magnetic off-bearer is lowered onto the empty pallets; then, as the off-bearer is positioned to pick up another load of green block, the magnet releases the empty pallets which drop to a conveyor chain. From here the pallets are carried through scraping, brushing, oiling and wiping stations and fed back into the block machine. No oil is wasted as the excess drains back into the reservoir where it is strained, ready for reuse. The entire unit is ruggedly built and mounted on casters for easy maintenance.

NEW LITH-I-SKIP

Thoroughly engineered to meet all requirements of the block plant operator, the Lith-I-Skip hoist operates with easy pushbutton control stopping automatically as it reaches the Up or Down position, with manual control for intermediate stops. A direct gearhead motor drive is used for most efficient power application. Installed with either vertical or inclined track, it is self-supporting and requires no guy wires or outside bracing. The unit is made in 30 and 50 cu. ft. capacities; it may also be had in any other popular size.

NEW ACCESSORIES FOR MORE EFFICIENT PLANT OPERATION AND MORE PROFITABLE PRODUCTION

NEW LITH-I-MIXER



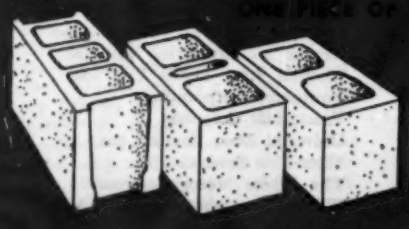
Ni-Hard Liners and Blades plus one-piece welded construction assure long life and economical operation.

Of advanced design, the new Lith-I-Mixer uses interchangeable, identical, Ni-Hard liners only 11¾" square on both drum shell and door. Absolutely maximum life is thus secured from a set of liners and replacement stock requirements are minimized. Sectionalized high-carbon steel plates which protect the drum head are also renewable. A double-hinged drum guard with protected handle is provided for safe, convenient charging. Motor and countershaft sheaves with multiple V-belt drive are completely enclosed in a heavy, two-piece, steel guard to meet all safety regulations as are the drive and pinion gears, which are available with either grease or oil bath lubrication. A full length water manifold insures even distribution of water. Clutch and discharge levers are conveniently located on the charging side. The mixer is made in both 30 and 50 cu. ft. capacities.

LITH-I-BLOCK MACHINE

A Product of THE LITH-I-BAR COMPANY HOLLAND, MICHIGAN

ONE PIECE OF EQUIPMENT OR A COMPLETE PLANT LAYOUT



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LITH-I-BAR CO. HOLLAND, MICH.

Please send full information on LITH-I-BLOCK MACHINE

Firm Name_____

Individual_____ Position_____

Address_____ Phone_____

City & State_____

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Increase profits, reduce costs — with EFCO "Lifetime" Steel Forms. They save time, material, money. Adaptable to wide use. Available in many types of regular and special sizes.

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Servicised CLEAR *Concrete Curing Compound*

2 TYPES { • WAX-RESIN • RESIN BASE

- Meet all standard specifications for each particular type
- Do not alter appearance of concrete
- Dry rapidly . . . form clear, vaportight membrane

Servicised Clear Wax-Resin and Resin Base Curing Compounds are widely used for curing exposed concrete — pavement slabs, bridge structures, abutments, walls, etc. Sprayed or painted, they form a uniform moisture-retaining membrane. Available with fugitive dye to assist in proper coverage.

Write for complete details and circular on Servicised Concrete Curing Compounds.

SERVICISED PRODUCTS CORPORATION
6051 West 65th Street, Chicago, Illinois

Air-Jet Vibrator Device Uses Directional Vibration

Arching and "hang-up" of cement and aggregates in the collecting hopper at the Sun Valley, Calif., batching plant of Consolidated Rock Products Co., Los Angeles, Calif., has been minimized through the use of a new type of external vibrator.

● This air-jet operated external vibrator has licked the problem of arching and "hang-up" on a collecting hopper at the Consolidated Rock Products Company's plant in Sun Valley, Calif.

Called the AeroViber, the unit is inexpensive and simple to install when compressed air is available. The only moving part is a single 1⅝-in. steel ball which is propelled at high speed around a circular track within a cylindrical steel housing by the jet of compressed air. The weight of the ball develops strong centrifugal force which is transmitted to the hopper as directional vibration. The unit is mounted so the air intake points in the direction of the desired movement of the bulk material.

The device is manufactured by the Viber Co., Burbank, Calif., and is available in four sizes, using balls from 1 in. to 1⅞ in. in diameter.

George H. Lash has been appointed superintendent of the new Price Bros. Company plant in Columbus, Ohio. He formerly was associated with the U.S. Concrete Pipe Company in Newton, Ohio.

List of Exhibitors — N.C.M.A.

Adamson United Company
Adrian Peerless, Inc.
Almar Specialty Machine, Inc.
American Webco Corporation
Berg Vault Company
Bergen Machine & Tool Co.
Besser Company
Blaw-Knox Company
Builders Equipment Company
Burkhart Engineering Associates, Inc.
L. Burmeister Company
The Burns & Russell Co.
Butler Bin Company
Calcium Chloride Institute
The Celotex Corporation
Chain Belt Company
Champ Corporation
Chicago Fly Ash Company
Cleaver-Brooks Company
Cleveland Vibrator Company
Columbia Machine
Concrete Products & Rock Products
Concrete Publishing Corporation
Concrete Transport Mixer Co.
Construction Machinery Co.
Cook Bros. Equipment Co.
G. & W. H. Corson, Inc.
Curriers-Barbecues-Incinerators
Detroit Edison Co.
W. E. Dunn Mfg. Co.
Dur-O-waL division of Cedar Rapids Block Co.
Edick Laboratories
Engman Manufacturing Co.
Erickson Power Lift Trucks, Inc.
Ferro Corporation
Fleming Manufacturing Co.
Forney's, Incorporated
General Engines Co., Inc.
Heltzel Steel Form & Iron Co.
Holland Machinery Co.
Imperial Construction Equipment Co.
The Jaeger Machine Company
C. S. Johnson Co.
J. A. Jones Concrete Machinery Co.
Kent Machine Company
The Knickerbocker Company
Kwik-Mix Company
Le Roi Division, Westinghouse Air Brake Co.
Lith-I-Bar Company
Littleford Brothers, Inc.
Maclean-Hunter Publishing Corp.
J. Fred Malane
Marble Face Blocks, Inc.
The Master Builders Company
Monarch Road Machinery Co.
Multiplex Machinery Company
National Concrete Masonry Assn.
The Gene Olsen Corporation
Oswalt Engineering Service Corp.
Park Tool Company
Perfection Steel Body Co., Inc.
Pit & Quarry Publications
Precaster, Inc.
Pumice, Inc.
Arthur Rehberger & Son, Inc.
Reo Motors, Inc.
John Selden
Shore Engineering
Siliphane Corp. of America
The T. L. Smith Company
Solvay Process Division, Allied Chemical & Dye Corp.
Southeast Ready-Mix Concrete Co.
Southwest Industries, Inc.
Spray-O-Bond Company
Standard Dry Wall Products, Inc.
Stearns Manufacturing Co., Inc.
Thomas Steel Forms Co., Inc.
Towmotor Corporation
Tracto-Lift Company
Universal Door Carrier, Inc.
Vibro-Plus Products, Inc.
The White Motor Company
Willard Concrete Machinery Sales Co.
Al Willis Sales Co.
Worthington Corporation

National Concrete Masonry Assn. Convention Program

Hotel Carter and Cleveland Public Auditorium, Cleveland, Ohio, Jan. 24-27

MONDAY, JANUARY 24
GENERAL SESSION

Badge required for admittance to all sessions. Registration fee of $20 per person for non-members attending program sessions. Exposition requires no registration fee.

8:30—Registration—Lakeside entrance, Cleveland Public Auditorium
9:30—Music—Music Hall
10:00—Convention opens—Music Hall
Presiding—President M. E. Rinker
Invocation—Rev. Louis M. Brereton, St. Peters Episcopal Church
Treasurer's Report: Carroll Strohm Jr., secretary-treasurer, N.C.M.A.
Election of Directors: Horace Bush, chairman, Nominating Committee
10:20—"Where Do We Go from Here?" by E. W. Dienhart, executive secretary—A frank appraisal of N.C.M.A.'s activities and plans for the coming year.
10:40—President's Message—President M. E. Rinker
11:00—Report of budget and finance committee—A. R. Waters, chairman
11:15—Report of local, state and regional association committee—Philip Paolella, chairman
11:30—"YOU Make the Difference" by William H. Gove, vice-president for sales, EMC Recordings Corp., St. Paul, Minn.
12:00—"Your Money's Worth" by W. R. Ireland, chairman, Membership Committee
12:20—"Recent Developments in Washington as They Affect the Concrete Products Manufacturer" by Theodore Leba Jr., manager, Washington office, N.C.M.A.
12:40—"Architectural Possibilities of Concrete Masonry in Home Construction" by Elizabeth Gordon, editor, House Beautiful Magazine
1:00—Award of Early Bird door prize
1:05—Formal Opening—Concrete Industries Exposition, Exhibit Hall, Cleveland Public Auditorium
6:00—Concrete Industries Exposition closes Tuesday, 1:05 p.m.
8:30—Get-Together Party—Rainbow Room, Hotel Carter

TUESDAY, JANUARY 25

8:30—Registration—Lakeside Entrance, Cleveland Public Auditorium
9:30—Music—Music Hall
10:00—Meeting opens—Music Hall
Presiding—Otto Buehner, chairman, Promotion Committee
10:15—Movie—"It's Everybody's Business" a movie explaining our business system, produced by the U.S. Chamber of Commerce
10:45—"Unit Masonry Association Points the Way to a Bigger Masonry Construction Market" by Tip Brown, executive secretary, Mo-Kan Concrete Products Association
11:15—"A Guinea Pig's Ideas of N.C.M.A.'s Promotions Program" by Otto Buehner
11:30—"How To Capture a Larger Share of the Building Dollar" by W. P. Markert, director of promotion, N.C.M.A.
12:00—"How The Architect Views Product Advertising and Promotion of Construction Materials" by Ben John Small, A.I.A., LaPierre, Litchfield & Partners
12:20—"Use of Concrete Masonry in Detroit Area" by Clair W. Ditchy, president, American Institute of Architects
12:40—"Portland Cement Association's Advertising and Research Program on Concrete Masonry" by G. Donald Kennedy, president, Portland Cement Association
1:00—Award of Early Bird door prize
1:05—Concrete Industries Exposition opens, Exhibit Hall, Cleveland Public Auditorium
3:00—Symposium on High Pressure Steam Curing—South Hall A
6:00—Concrete Industries Exposition closes until Wednesday, 1:05 p.m.
7:30—Annual Banquet—Rainbow Room, Hotel Carter

WEDNESDAY, JANUARY 26
PROGRAM SESSION

8:30—Registration—Lakeside entrance, Cleveland Public Auditorium
9:30—Music—Music Hall
10:00—Meeting opens—Music Hall
Presiding—Benjamin Wilk, chairman, Technical Problems Committee
10:20—"What M.C.A.A. Is Doing to Broaden the Market for Masonry Construction" by John Taheny, president, Mason Contractors Assn. of America.
10:40—"Hurricane Resistant Construction" by E. R. Mangotich, assistant engineer, N.C.M.A.
11:00—"Studies of Block Curing and Drying Methods" by C. C. Carlson, manager, Products Development Section, Research and Development Laboratory, P.C.A.
11:20—"Concrete Masonry in Military Construction Program" by Harry Zackrison, chief, Engineering Division, Military Construction, Office of the Chief of Engineers, Washington, D.C.
11:45—"Is Engineering and Technical Research Important?" by R. E. Copeland, director of engineering, N.C.M.A.
12:15—Paint and Waterproofing Panel
Moderator—E. A. Peterson
Panel—Harold Lutes, Hugo Quillian, E. E. Osborne, William S. Sells
1:00—Award of Early Bird door prize
1:05—Concrete Industries Exposition Opens, Exhibit Hall, Cleveland Public Auditorium
6:00—Concrete Industries Exposition closes until Thursday, 1:05 p.m.

THURSDAY, JANUARY 27

8:30—Registration—Lakeside entrance, Cleveland Public Auditorium
9:30—Music—Music Hall
10:00—Meeting opens—Music Hall
Presiding—S. Carl Smithwick, president-elect
10:15—N.C.M.A. Safety Contest Awards—Earl W. Peterson, chairman, Accident Prevention Committee
10:45—"Block Plant Laboratories" by Henry Toennies, assistant engineer, N.C.M.A.
11:05—"The Mason's Trade—An Art and a Profession" by Thomas Murphy, treasurer, Bricklayers, Masons and Plasterers International Union of America
11:30—"Trade Relations Committee Report" by H. W. Bush, chairman, Trade Relations Committee
12:00—Report of International Congress of Pre-Cast Concrete held in Brussels, Belgium, June 20-27, 1954—Gilbert E. Olson, president, International Pre-Cast Concrete Manufacturers
12:30—"The Value of Belonging to a Trade Association and What It Means to the Member Producer" by Charles W. Harbaugh, director of sales promotion, U.S. Chamber of Commerce, Washington, D.C.
1:00—Award of Early Bird door prize
1:05—Concrete Industries Exposition opens, Exhibit Hall, Cleveland Public Auditorium
6:00—Concrete Industries Exposition closes

A.C.I. Offers New Booklet Discussing Admixture Uses

Admixtures for Concrete, a handy 36-page booklet containing the A.C.I. Committee 212 report, is now available. The booklet divides admixtures into 11 groups and discusses their relative importance and uses. Included in these groups are the following: accelerators, retarders, air-entraining agents, gas-forming agents, cementitious materials, pozzolans, and workability agents.

The booklet is available for 75 cents by writing to the American Concrete Institute, 18263 West McNicholas Road, Detroit 19, Mich.

Ready-Mixed Concrete Plants Opened in Several States

Proof of the trend toward expansion in the ready-mixed concrete industry is the ever-growing list of new operations in various states. Here are a few of the new plants reported:

Atlas Ready-Mix, Inc., Topeka, Kans.; J. C. Powell Construction Company, Winfield, Kans.; and Home Concrete Supply Company, Ulysses, Kans.

Mobley Construction Company, Searcy, Ark.

Oakridge Sand and Gravel Company, Oakridge, Oreg. (added a ready-mix operation).

Trogden Construction Company, Farmington, Mo.

County Concrete, Inc., Newton, Ohio.

West Penn Contracting and Engineering Company, Irwin, Pa.

Burgess-Brogdon Building Supply Company, Sumter, S.C.

Charleston Ready Mixed Concrete Company, North Charleston, Vt.

Carthage Ready Mixed Concrete Company, Carthage, Ill.

Pipkorn Fuel & Supply Company, Oshkosh, Wis.

Canadian Producer Tells Buyer To "Try These on for Size"

John Pennachetti, president of the National Concrete Products Association and also head of the Thorold Concrete Block Company, Thorold, Ontario, has solved the problem of exhibiting patio block patterns.

He has several small blocks of different colors in a sand pit in one corner of his show room. Customers are permitted to arrange the blocks in any pattern they wish; thus they can order units more intelligently.

Purchase of Maule Industries Expands Ferre Interests in U. S.

Sale by Chemical Research Corporation of the controlling stock in Maule Industries, Inc., the largest concrete masonry firm in southern Florida, to Ferre Industries, of Puerto Rico, was recently announced by J. H. Buchanan, president of Maule.

The $4,500,000 investment by the Puerto Rican firm is a display of faith in the continued activity and sound basis for expansion in the area served by Maule. Ferre Industries, founded by Antonio Ferre Sr., is now jointly owned and operated by his four sons—Jose, Luis, Carlos, and Herman. The elder Ferre is now retired but acts as adviser to the firm. Starting with a small foundry in the 1920's, he sent his sons to schools in the United States while he carefully built up his holdings.

As each son graduated, he went to work for his father. The family always aimed at being "builders" by expanding and developing their properties through sound management. Among the firm's many holdings in Puerto Rico are the Ponce Cement Corporation and the Puerto Rico Cement Corporation. So successful have they been in this that they have acquired the reputation of "never selling but always improving."

In line with this improvement policy is the announcement that in a recent deal involving $3,077,000 the concern purchased the Miami Crushed Stone Company, the Peninsular Concrete Company, the Material Sales Corporation, and Tropical Farms. In another such acquisition Ferre purchased for $1,339,743 the assets of the Alfred Destin Company and the Destin Block Company. Coupled with the buying of Florida real estate worth more than $500,000 in the last year and a half, these changes in ownership constitutes a major impetus in the growth of the area by providing building material in sufficient quantity for any future increase in building activity. In the words of President Buchanan, "Our present facilities are more than ample for our need, but we shall continue to expand *before* the need arises to keep well ahead of south Florida's tremendous yet sound industrial growth."

According to Jose Ferre, the new controller, the concern will continue to turn out high-quality concrete products of widely varied uses utilizing basically the same leadership under which it prospered before the change in ownership. Mr. Buchanan will continue as president, M. F. Pafford will remain as executive vice-president and treasurer; but due to demands from his other interests in Florida, Canada, and elsewhere, J. Bradley Streit, former board chairman, will relinquish that post and become a board member. Maule operates two plants in the Fort Lauderdale area, five near Miami, and one each at Ojus, Homestead, and Miami Beach. The firm has over 900 employees, with a payroll which amounted to $3,979,710 in 1953.

Completion of Maule's main executive offices in Miami, slated for April, 1955, will provide a modern, three-story center for the firm's activities. This building will serve as a functional showcase for the multiplicity of rock and concrete products manufactured by the concern. A fiber conduit system on a modular grid will be placed just below the floor level so that electrical and telephone conduit outlets will be easily accessible. Among the products featured which add color and interest to wall surfaces will be the firm's precast gravel-imbedded panels and marble-chip-surfaced block.

Chemical Research Corporation, the former owners of Maule, indicated that they disposed of their interest in the concern in order to diversify their investments and develop other Florida properties.

Through the far-sighted policy of the Ferre brothers southern Florida will benefit by the amalgamation of interests, investment of large amounts of capital, availability of large amounts of building materials, and most of all, by the faith—backed up by dollars—exhibited in the continued prosperity of the area.

Weston Named President At Mo-Kan Annual Meeting

At the annual meeting of the Mo-Kan Concrete Products Association, Kansas City, Mo., on December 14, the following officers were elected for 1955: L. R. Weston, Cinder Concrete Products, Inc., president; J. R. Slaton, Slaton Concrete Products, vice-president; Dale Williamson, City Block & Products Company, secretary; and George W. Kulhavy, The Carter-Waters Corporation, treasurer. The retiring president, Gus Main, Kansas City Concrete Pipe Company, was commended upon his administration and the progress made during the year.

This association maintains an office at 1207 Commerce Building in Kansas City. Its scretary-manager is Tip Brown, who has served in that capacity for several years. Membership is drawn from concrete products producers in the Greater Kansas City area.

The George F. Strauss Cinder Block Co., Denver, Colo., has purchased a 47-acre gravel pit in Adams City, Colo., for $218,500. The pit, which has an output of 900 tons of washed sand and gravel per day, will be operated as the Strauss Sand and Gravel Company, Inc.

● Left: Jose A. Ferre, one of the four brothers who now operate Ferre Industries; Antonio Ferre Sr. (seated), founder of the firm, who now serves as the company's adviser; and Maurice A. Ferre, a third-generation member.

Right: Mr. Ferre with J. Bradley Streit, former board chairman, and J. H. Buchanan, president of Maule Industries.

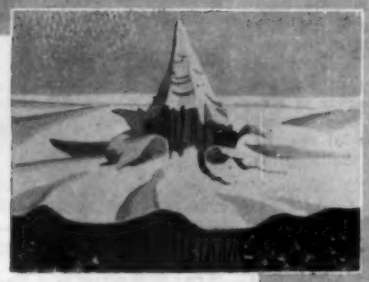
WHY MEDUSA INTEGRAL water-repellents . . . are the BEST MOISTURE BARRIER!

● Medusa Moisture Barriers made with Medusa Waterproofings are water repellent, puncture-proof, tear-proof and non-porous. You simply can't break, rip, or tear them like you can moisture barriers of plastic films, building coatings and the like.

Medusa Waterproofed Cements are integral. Unlike a coating, or a sheet, or a film, they permeate through every square inch of the concrete mass . . . every single pore, making the concrete structure an impregnable fortress against water.

When you can have integral moisture barriers at the same cost as other methods, why take chances with films and coatings. Furthermore, you know Medusa Waterproofed Cements are successful because they have a proved 48-year record of stopping moisture. They are the finest protection possible for footings, foundations, basement floors, utility room and garage floors.

You can make your integral moisture barriers by either using Medusa Waterproofed Gray Portland Cement or Medusa Waterproofed White Portland Cement, or by mixing Medusa Waterproofing Paste or Powder with any regular portland cement.



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You Can't Tear Medusa Water Repellents

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WATERPROOFED GRAY • AIR ENTRAINING • STONESET
HIGH EARLY STRENGTH • BRIKSET
WHITE TILE GROUT CEMENT

MAKERS OF AMERICA'S FINEST PORTLAND CEMENTS FOR OVER SIXTY YEARS

● Lightweight prestressed concrete beams and slabs were manufactured at the plant to job specification and hauled to the construction site (120 miles away) for the first time in the Northwest by Empire Prestressed Concrete of Oregon, a subsidiary of Empire Building Material Company. Lite-Rock prestressed beams and slabs made by this firm were used recently in the construction of the new C. & S. Electrical Building in Eugene. The practice is also being used in the erection of the TV station building in Eugene.

F.C.C. Offers Rule Changes Affecting R.M.C. Truck Radio

On November 3, 1954, the Federal Communications Commission issued a proposed revision of its rules governing special industrial radio services. The principal changes as they may affect producers of ready-mixed concrete are as follows:

The definition of commercial or industrial activities providing specialized functions which qualify for licenses has been expanded to include "delivering and pouring ready-mixed concrete, hot asphalt mixes, and similar perishable mixtures." (Last four words were added.)

The restrictions against radio operations in standard metropolitan areas of 500,000 or more population has been relaxed to permit authorization of operations in these areas "upon showing that transmitting equipment will in fact be used in an area of low population density removed from the urbanized sections of the standard metropolitan area involved".

Any present users of special industrial radio services who may not qualify under the revised rules may continue to operate for five years from the effective date of the rules in order to enable them to amortize their equipment investment. During that period, however, they will not be permitted to expand their facilities or operations.

Concrete Conference Held At University of Minnesota

The fourth annual Concrete Conference was held on November 29 and 30 at the Center for Continuation Study of the University of Minnesota.

Highlights of the conference were addresses by Dr. Alfred O. C. Nier, professor and chairman of physics at the university, and R. E. Copeland, director of engineering for the National Concrete Masonry Association. Dr. Nier spoke on modern physics and engineering, and Mr. Copeland discussed lightweight masonry units and related construction practices.

Marietta Concrete Announces Appointment of H. de Bang

H. de Bang

Appointment of Henning de Bang as chief engineer for the Design Development and Engineering Division of the Baltimore, Md., branch of The Marietta Concrete Corporation, Marietta, Ohio, has been announced.

Before joining the Marietta organization Mr. de Bang was associated with Ford, Bacon and Davis, Inc., consulting engineers, New York City. He served as their field consultant on precast insulated wall panels which were developed jointly by Ford, Bacon and Davis and The Marietta Concrete Corporation.

His engineering experience has also included work as an industrial designer of cement plants, senior stress analyst on airplanes, in hydraulic design, and in structural engineering of power stations. A native of Denmark, he came to the United States after being graduated from the Royal Polytechnical College in Copenhagen.

Universal Concrete Pipe Builds Third Plant For High-Pressure Units

After contracting for a large amount of high-pressure concrete water pipe for the city of Muskogee, Okla., the Universal Concrete Pipe Company found conditions so favorable for the manufacturing of its product that it was decided to establish a permanent plant at that location. This plant, completed last fall, is capable of producing 44 16-ft., 48-in. diameter pipes each day. Each section weighs 7½ tons.

The new Universal operation is one of the firm's three high-pressure pipe plants in this country. It will produce 48-in. concrete steel-reinforced pipe for the water flowline from the Fort Gibson reservoir to Muskogee.

According to Cliff Davis, production manager, a sewer pipe machine will probably be installed at the plant for making conduits ranging from 12 to 144 in. in diameter.

Heaton Heads Advertising For Cedar Rapids Block Co.

R. M. Heaton

Robert M. Heaton had been appointed advertising manager for the Cedar Rapids Block Company and its affiliate, Dur-O-waL Products, Inc. All advertising activities regarding Dur-O-waL, masonry wall reinforcement, and other concrete products, including precast roof and floor systems, will be handled by Mr. Heaton.

For the last two years Mr. Heaton has been assistant to the advertising manager of Collins Radio Company, Cedar Rapids, Iowa. He has been associated with the newspaper advertising field, and is a graduate of the University of Iowa.

Prestress Engineering Company, Inc., and Henry J. Wiebe & Company, engineers, have moved to a new, larger location in Wichita, Kans., to provide room for expansion in producing prestressed structural concrete units.

A 7½-cent-an-hour wage increase retroactive to October 15, 1954, was granted recently to approximately 150 employees of the Builders Supply Company, Phoenix, Ariz., and the Arizona Precast Concrete Company, Mesa, Ariz.

B. D. Osterloh Appointed New Executive Secretary Of Nebraska C.M. Assn.

B. D. Osterloh

The appointment of Byron D. Osterloh, Omaha, Neb., as executive secretary and research engineer of the Nebraska Concrete Masonry Association was announced recently by Wallace Lillie of Fremont, president of the association.

Mr. Osterloh, who was graduated from the University of Nebraska in architectural engineering, is a member of the National Society for Professional Engineers. He has served as a naval architect at the Pearl Harbor, T.H., Naval Shipyard, and has been a structural and architectural engineer with the Omaha Public Power District and the Union Pacific Railroad.

Mr. Osterloh will maintain an office in Omaha. In addition to his new duties with Nebraska Concrete Masonry Association, he will also serve as a consultant for builders and architects using concrete masonry in their designs.

C. H. Zimmerman Heads Sales Of Dur-O-waL in Five States

C. H. Zimmerman

Carl H. Zimmerman has been appointed sales representative for Dur-O-waL Products, Inc., Toledo, Ohio. He will be in charge of Dur-O-waL sales in the Ohio, Michigan, Indiana, and western Pennsylvania, and West Virginia area.

Mr. Zimmerman was formerly Toledo manager for the Clevenger Company, Inc.

N.S.C. Helps Small Firms To Improve Accident Control

National Safety Council's Small Business Program, which was put on a full time basis in 1951, has been assured of continued progress through the increase of its grant from the National Association of Mutual Casualty Companies to $24,500. The added funds will enable the program to extend even more help to associations, local safety councils, and other business groups attempting to control work accidents. Many industries and local groups report injury rate reductions exceeding 50 per cent after only a few years of organized safety effort.

A. M. Baltzer, director of the Council's Small Business Program, points out that the Council's chief targets are the small, independent firms with fewer than 100 employees, in both manufacturing and nonmanufacturing industries. A booklet, "Plus Costs", available without charge from the Council, tells how accidents eat away profits and outlines the "why" and "how" of accident control.

Texcrete Co. of West Texas Building Plant at Sweetwater

At Sweetwater, Tex., the Texcrete Company of West Texas, a subsidiary of Texas Industries, Inc., Dallas, plans to erect a $250,000 plant for the production of concrete block.

It was indicated that the new facilities will have an annual capacity of 1,500,000 units of Haydite lightweight masonry units and Holiday Hill stone. Frank K. Locke of Dallas is supervising construction, which is scheduled to be completed by January. Production of block is to begin before the plant is finished.

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- MINIMUM JOB BREAKAGE
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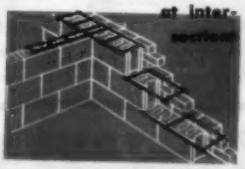
- NO OBSTRUCTION TO MECHANICAL TRADES

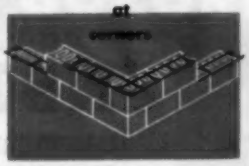
PLAIN or DEFORMED

In Solid or Cavity Walls

Prefabricated PARTITION-LOK at intersections



Prefabricated CORNER-LOK at corners



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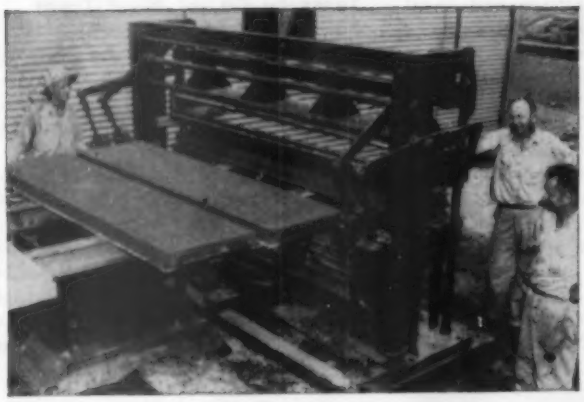

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N.Y. Concrete Masonry Assn. Names J. D. Daly President

John D. Daly, president of Auburn Cement Products Company, Inc., Auburn, N. Y., has been elected president of the New York State Concrete Masonry Association, Inc. Mr. Daly, who has served as treasurer of the organization for two years, succeeds Harvey H. Black of Domine Builders Supply Corporation, Rochester.

The election was held at the annual meeting of the Association at the Hotel Statler, Buffalo, on October 29.

Henry C. Quaritius Jr., Nailable Cinder Block Corporation, Brooklyn, was elected vice-president; Grant N. Reinhold, Anchor Concrete Products, Inc., Buffalo, was re-elected secretary; and Lawrence Dagostino, Dagostino Building Blocks, Schenectady, was chosen treasurer.

The meeting featured a visit to the plant of Anchor Concrete Products, where the new autoclaves were inspected in operation.

New Prestressed Division Formed by Utah Concern

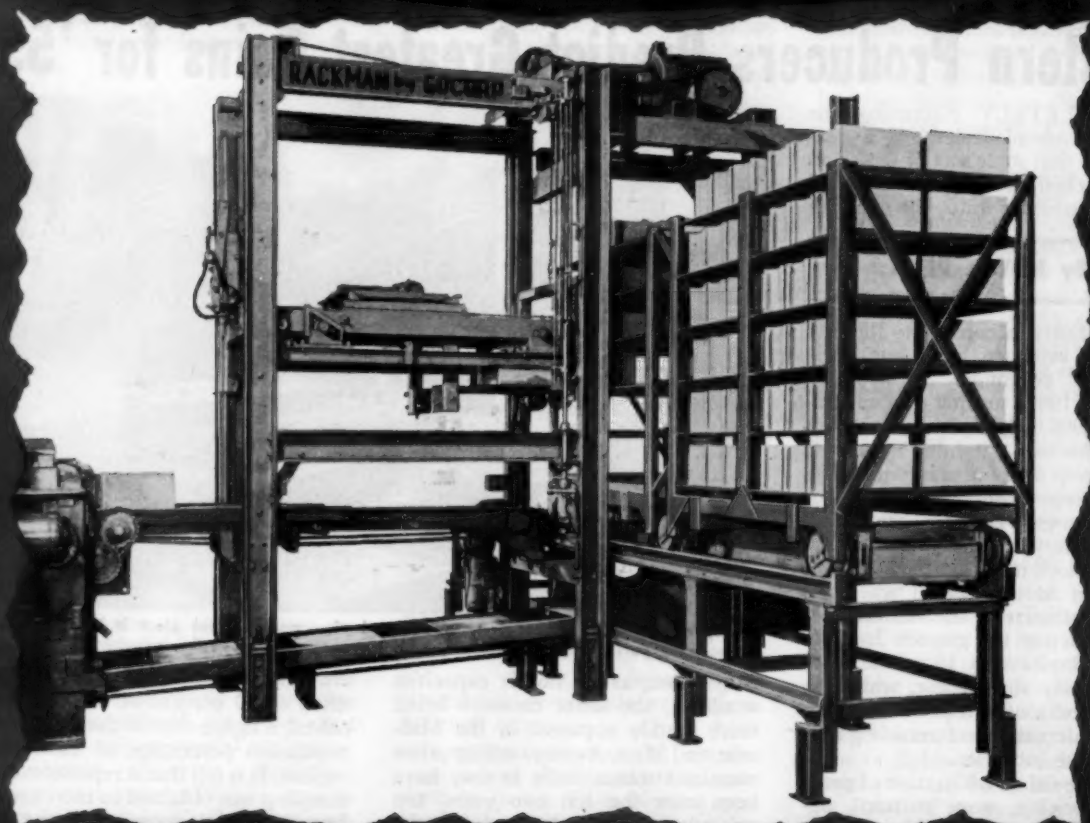
J. Eastman Hatch, president of the Utah Sand and Gravel Company, has announced the formation of the Prestressed Concrete Company. The new concern is to be a division of the sand and gravel company and is to produce pre-stressed, pre-tensioned concrete members.

Manager of the plant is Ezra C. Knowlton, who is executive vice-president of the parent concern. Consultant for the new operation was Arthur Anderson, president of Concrete Engineering Company of Tacoma, Wash.

B. C. Canoles, former box factory operator of Juneau, Alaska, recently executed a successful switch in business activity. He wasted no time after a disastrous fire had wiped out his factory, and promptly built a concrete block plant. Now he turns out a product with a much higher kindling point than wood, and one which is also in high demand in his area.

Barrett Industries, San Antonio, Tex., recently opened a new concrete products plant with a capacity of 9,000 block per day. These are lightweight units called Barlite, made from the firm's own expanded-shale aggregate. Barretts also make masonry mortar sand from the same aggregate. Other products are face tile and sewer pipe.

NOW AN AUTOMATIC RACK LOADING DEVICE . . . FOR *YOUR* BLOCK MACHINE!



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Block Industry Has Another Record Year

Western Producers Predict Greatest Gains for '55

COMPLETELY disproving the widespread feeling of a year ago that some sort of peak had been reached in the production of concrete masonry units, the concrete

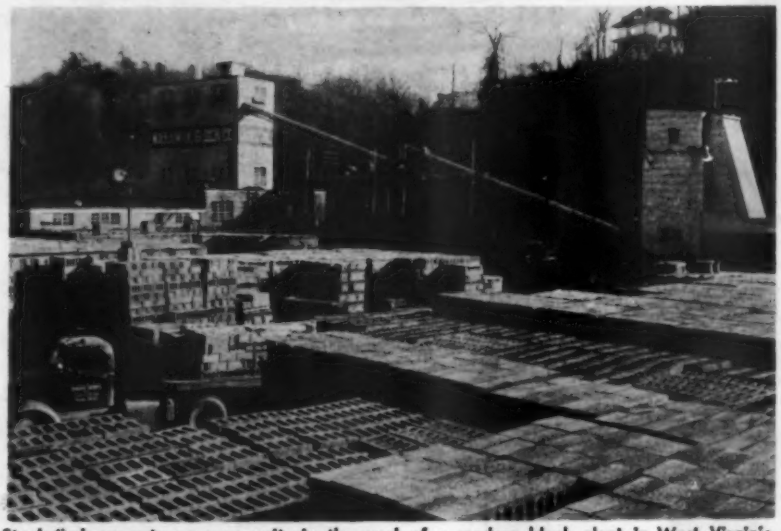
By ROY L. PECK

block industry, according to the best available evidence from our questionnaire, continued its upward sweep in 1954, turning out an estimated 1,900,000,000 8-in. equivalent units. This was a gain of perhaps 5 or 6 percent over the preceding year's record output. Should this rate of production gain continue, we should with certainty see the epochal 2,000,000,000-block mark attained in 1955. Optimism in this regard was scattered, producers in the western section predicting the greatest increase in their business in 1955, the midwestern only slightly less, while the eastern and southern producers were fairly conservative in forecasting only a moderate increase.

Evidence of a stabilization of practice in pricing, wage patterns, operating time and machine capacities and a trend toward plant consolidations was apparent. In the comparatively few years of its existence the industry has had a growth unparalleled by that of any masonry building material business and has attained top stature in this period. It is perhaps time that the leavening influence of being "big business" exerts its definitive pattern on all members of the industry, eliminating the lazy-minded and awakening the alert to the twin responsibilities of retaining efficiency with large-scale production.

Fewer but larger plants appear to be the trend in all sections of the country, this being particularly noticeable in the South and West. This trend is comprehensible as the efficiency of using high-production equipment and methods is increasingly evident to producers operating in these faster-growing areas. The factors of installing better equipment and hiring more personnel were reflected in the reports from the South. Machines were being operated more hours per day, except in the Midwest, where labor restrictions in the more highly unionized area evidently held down overtime.

Machine capacity rose in the average plant, as did hourly capacities available, the latter measure being more readily apparent in the Midwest and West. Average selling prices remained substantially as they have been over the last two years, top prices being received, as usual, in the West. Wages continued their slow upward spiral, probably as a result of the gradual unionizing of the industry. The percentage gain in wages was lowest in the high-bracketed West, indicating perhaps an approach to the maximum wage consistent with a high degree of mechanization of block production, which in all industry must lower the costs as the limit of mechanization is neared.



Stockpiled concrete masonry units in the yard of a modern block plant in West Virginia, a necessary part of the large-scale production characteristic of the industry today.

The percentage of lightweight blocks to total production in most sections increased imperceptibly, to remain just around the 50 percent mark, the exception being in the West, where this proportion greatly increased over the preceding year.

In our reference to different areas of the country, it might be explained that the eastern portion includes plants in 13 states, with Virginia as a southern boundary; the Midwestern area comprises 13 states including the Dakotas, Nebraska, Kansas, Missouri, Kentucky, and Ohio; the southern territory embraces the 11 states south of the Kentucky-Tennessee boundary and its extension east and west; the 11 remaining states comprise the western area. Returns received from producers in the eastern and Midwestern sections consisted of 70 percent of the total received, a figure close to the combined population percentage of those two regions. It is felt that a representative sampling was obtained in most areas, from a careful appraisal of the returns from firms producing approximately 250,000,000 units in 1954. A more detailed analysis follows of the facts reported by those producers who replied to our questionnaire.

Production Volume Data were received from firms whose volume represents about 13 percent of the estimated total production for 1954. These firms also provided comparative volume figures for 1953. Nationwide in scope, the sampling indicated a production increase of 11.8 percent for 1954 over the preceding year. All segments reported gains, the South leading with 19 percent, the West with 12 percent, the Midwest with 11 percent, and the East estimating a 6 percent increase. Because of the impossibility in a survey of this type of obtaining accurate cross-section sampling, it is felt that an average overall increase of 5 or 6 percent will more truly reflect existing conditions.

In all of these reports and the conclusions derived from them it must be borne in mind that our sampling was not necessarily a true cross-section of the industry, especially in respect to the sizes of the operations involved. The relatively

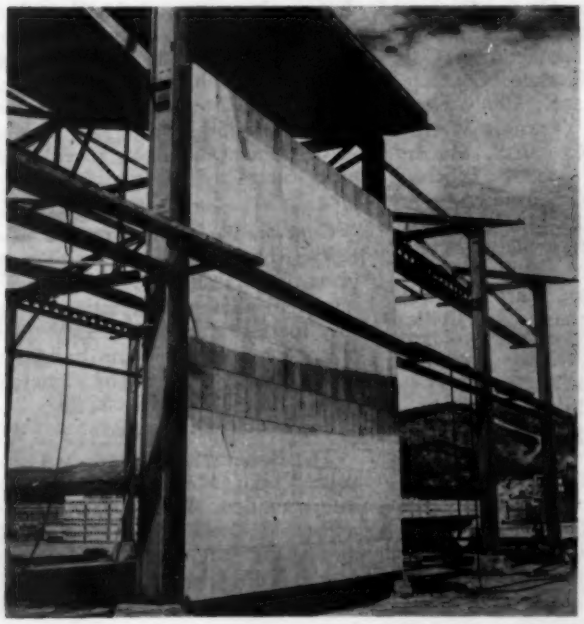
lower increase shown in the East is reasonably explained by the prevalence of cement shortages or strikes or by the restrictions of antiquated codes and labor attitudes (in that sequence), according to our informants.

The South is evidently enjoying an upsurge in all classes of construction in which concrete masonry units form the major volume in the structure, as no mention of any of the foregoing troubles is reported from that section. The increase reported in each area more or less parallels the construction volume increase found in 1954 in that area. This continuing volume would indicate that the so-called "buyer's market" has not as yet definitely materialized in the block industry, nor seriously affected it.

Future Outlook Summarizing the expectations of the block producers for 1955 in terms of business conditions in their respective territories, we find a wide variance of opinion. Those in the western portion of the country are most optimistic, looking forward to perhaps 23 percent better business volume in 1955. Major factors governing this attitude are these: vast industrial and residential expansion; installation of more productive equipment; greater public acceptance of block in all classes of construction; no cement shortage; and better economic conditions in large western cities. The Midwest reflects attitudes only slightly less hopeful, advising that more cement is available, more construction of schools and industrial buildings is planned, and labor demands are at least temporarily stabilized. The cross-section of opinion in the East and South is that 1955 will show only slight gains, the final result depending most upon cement availability, continued high construction volume, and retention of low mortgage rates.

Reportedly, much new equipment is to be installed in southern plants, which would indicate a still unvoiced anticipation of increased business in 1955. In this connection, remarks made by one operator might bear repeating here: "Every $1,000 spent in improving the equipment of a block plant will bring in three times that amount in profit the next year. That is what we are going to do in 1955." Upwards of $2,000,000 worth of improvements were reported to be contemplated by producers who answered our questionnaire. When projected into an industry-wide figure of over $15,000,000, this prediction is significant as to this improvement trend.

Cement Supply It is the consensus of opinion of most of our producers that in most areas cement has been made available in sufficient quantities to correct shortages experienced over the last few years in and about many cities, particularly in the East. No lost production because of this reason was reported by any producer in the South. About one-third of the reportees in the Midwest experienced some lost volume, due mainly to periodic and isolated cement shortages in the cities within the shipping area of plants supplying cement for toll road construction or for a few monumental concrete bridges. Upwards of 50 producers in the East and Midwest areas believed that they would have produced a total of perhaps 3,000,000 more blocks in 1954 had they been able to obtain all the cement they wanted. Practically no losses of production due to cement shortage were reported in the western section. A scattered few block makers ventured predictions of isolated shortages in 1955 in areas where a large volume of highway construction was planned. It is fairly apparent that in reaching the consumption figure of 23,000,000 bbl. of cement annually, the industry has attained a high cement priority.



An example of prestressed concrete masonry units, an application becoming increasingly more important in the industry. Here a panel of prestressed tongue-and-groove siding is welded to the center bay of an industrial building.

Lightweight Units Use of lightweight aggregates varied widely in the different areas of the industry. The overall average of plants reporting on this subject indicates that about 50 percent of the 1954 total volume was lightweight units. Of this lightweight aggregate, 43 percent was cinders, 27 percent clay or shale, 17 percent slag, 7 percent pumice, 4 percent scoria or volcanic cinders and 2 percent other types. On an area basis, the proportions of lightweight blocks were 74 percent in the West, 59 percent in the East, 52 percent in the Midwestern plants, and 24 percent in the South. Western use of lightweight aggregate increased 13 percent over the amount reported used in 1953, while other areas showed only a 3 or 4 percent gain. This increasingly high percentage of lightweight units in the West is probably due to the ready availability and comparatively lower cost of such material in the Pacific states.

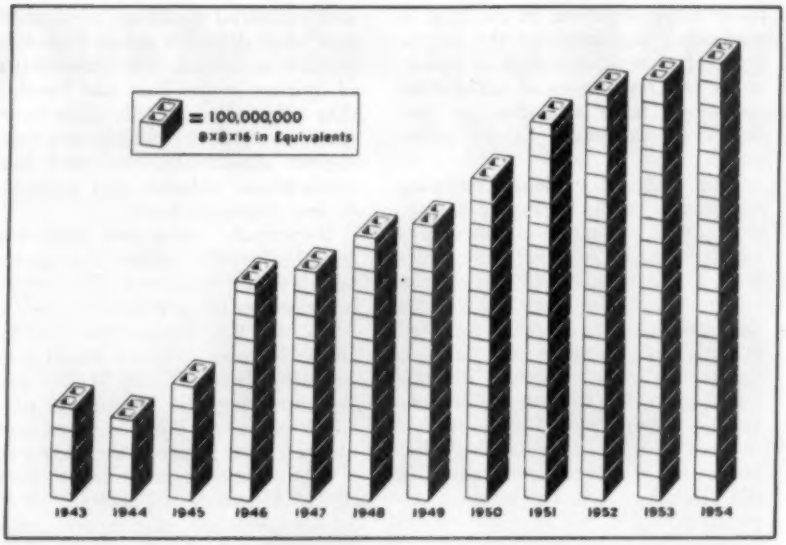
Hourly Capacity Returns showed an average of 1.45 machines per plant, a gain of 4 percent over the number shown for 1953. The hourly capacity in units per plant, however, was reported as 977 blocks against 886 blocks made in the prior year—representing about a 10 percent capacity increase. The capacity in blocks per hour per machine was stated to be 644 units, compared to the 621-unit output reported by the same plants in 1953; this is a gain of about 4 percent. An increase of 2 percent occurred in the operating hours per machine for the entire year, the figure of 1,605 hours being reported against 1,577 hours of operation for 1953. This apparently reverses the trend shown in last year's survey, reporting a drop

in the machine-operating time in 1953 under that for 1952. There is some discrepancy between these figures and those of the previous survey, which is understandable in view of the fact that it is impossible to study all of the same plants each year.

Wages The average wage paid in the industry during the year was reported to be $1.44 per hour, representing an increase of just over 5 percent above the $1.37 per hour reported by the same firms as paid in 1953. This gain is a part of the steady climb of the wage spiral during the last eight years. The average wage varied considerably in different areas, but showed about the same percentage increase in all parts of the country. Hourly wages were reported as increasing in the Midwest from $1.47 to $1.54, from $1.70 to $1.73 in the West, from $1.33 to $1.41 in the East, and from $.97 to $1.02 in the South. The average number of employees in the plants reporting was 18.6 employees per plant for 1954. Unfortunately, no data was requested on this factor for 1953, so no comparison can be drawn. It is interesting to note, however, that area-wise this average varied in the number of hourly-wage employees, from 15.6 in the Midwest, 17.9 in the East, 22.4 in the West, to 25.7 in the South.

Prices The average price of an 8-in. unit, as reported by all producers for 1954, was 19.9 cents per 8-in. equivalent unit. Wide variation of prices was reported from the different sections of the country, the average in the Midwest being 19.0 cents, in the west 25.0 cents, in the East 18.7 cents, and in the South 20.0 cents per unit. The significant note in the study of the pricing data quoted is that prices of concrete units did not change during 1952 through 1954, this leveling-off now being of two years' duration. This situation continued despite the fact that the ingredients of concrete blocks have increased in cost appreciably over the last two years. Cement went up over 5.0 percent and sand 7.0 percent over the same period.

Canada Our survey coverage was very limited in Canada, and only an insignificant sampling resulted. Data in replies from firms producing only a total of 20,000,000 units in 1954 might possibly indicate trends north of the border, but the figures are not to be taken as an accurate projection of conditions existing in the industry as a whole in Canada. These scanty replies showed a 40 percent increase in production of blocks over the previous year, a quantity which in turn had been 32 percent more than was produced in 1952. Both these figures are undoubtedly much too high.



Lightweight units constituted 28 percent of the total blocks made in 1954. The average hourly wage increased from $1.26 to $1.31 in 1954, while prices of units showed no change over the last year and remained at an average of 24.1 cents per 8-in. unit. Canadian producers were only modestly optimistic over prospects for 1955 and expected to increase their plant or machine capacities in accordance with the augmented demand expected in each case. None of the companies answering the questionnaire reported any lost production for any reason in 1954.

C. M. Products Plants Opened In Widely Scattered Areas

The following are among the many new concrete products plants which have been opened recently.

Prestress Engineering Company, Inc., Topeka, Kans.; Corsica Cement Block Co., Corsica, S.D.; Dunseith Cement Block Manufacturing Co., Rugby, N.D.; Kasson Concrete Corp., Kasson, Kans.; Henly Concrete Products, Yakima, Wash.; Shoals Concrete Co., Inc., Shoals, Ind.; Slaton Block Co., Inc., Liberty, Mo.; Valley Concrete Products, Inc., Knoxville, Tenn.; La-Lite Block Co., Lake City, Tenn.; Neville Concrete Products Division of Pittsburgh Coke and Chemical Corp., Warren, Ohio; and Concrete Pipe, Inc., Evansville, Ind.

Cement Blow-Back Causes Freak Storage Silo Failure

Complete collapse of a cement storage silo occurred recently at the A. M. Hodges Ready-Mixed Concrete plant at Warsaw, Ind., evidently caused by the cement bridging and then falling suddenly, producing an air compression blast that blew the top off the silo.

Built of reinforced concrete, the silo, which measured 10 by 12 ft. in area and 44 ft. high, held its full capacity of some 1,300 bbl. of cement just prior to the accident. When about 100 bbl. had been withdrawn, the cement bridged and a cavity was formed in the center of the tank. In a matter of seconds the top portion fell, and the confined air pocket blasted upward. With the top of the silo blown off, the weight of the cement, acting as a semi-fluid mass, completed the destruction.

Concrete Farm Structures, a new British volume by A. M. Pennington, gives plans, sections, working drawings, and all the information necessary for the erection of many types of concrete masonry farm buildings. The book is published by Concrete Publication Ltd. Price, $2.80.

The Geneva Rock Products Company, Orem, Mo., was recently put into operation. The $200,000 ready-mix concern will employ between 20 and 30 men and use four ready-mix trucks. A. D. Johnson is the secretary-treasurer and sales manager.

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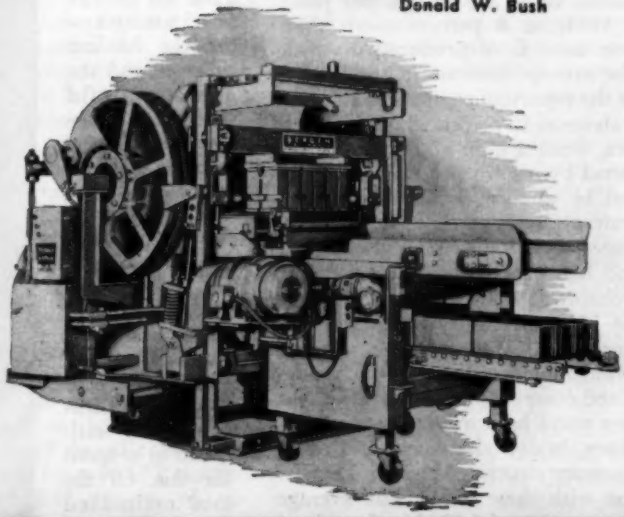


BERGEN MACHINE & TOOL CO., INC., NUTLEY, N. J.

Ready-Mixed Concrete Has Another Record Year

By ROY L. PECK

INFORMATION contained in returns from ready-mixed concrete producers who answered our questionnaire as to their respective production over the last three years leads us to believe that the industry produced about 61,500,000 cu. yd. of concrete in 1954. The average estimate of these producers was that their business was 12 percent better in 1954 than in 1953 production, which in turn was 8 percent ahead of the preceding year. Taking all factors of the returns into consideration, we believe that a figure of 6 percent probably represents a more accurate estimate of increase.

Lacking a complete survey of every plant in the industry, or an accurate cross-section of the industry —neither of which is available today — any statements as to output must at best be but well-informed estimates. Other facts submitted in the returns, however, are factual and permit of reaching conclusions which can be the bases of accurate and interesting comparisons. We have endeavored to follow this procedure in reporting the following information made available to us.

Production Volume Producers reported an average of 1.57 plants per company, with production of 44,250 cu. yd. per plant in 1954, or 8 percent more than these same firms produced in 1953. The average increase in production for the reporting companies, referred to above as 12 percent, varied in each area, from a high of 24 percent reported by eastern producers, 13 percent by western, 8 percent by midwestern, to 7 percent increase averaged by producers in the South. Toll highways built during the year probably accounted in large part for the higher volume increase in the East, as this construction offered considerable yardage to the ready-mixed concrete plants located so that they could haul to the many underpasses, bridge abutments and other accessory structures built in connection with these roads. The average consumption of 1.33 bbl. of portland cement per cu. yd. of concrete produced was very uniform in all areas. Based on this factor, the industry made use of around 82,000,000 bbl. of cement, or just over 30 percent of the total output in 1954. This uninterrupted series of gains over the last eight years denotes a healthy growth of an industry which has consistently utilized equipment and method betterment to build to the present position from the low point it experienced in the early 30's.

Future Outlook Looking ahead, producers predicted that 1955 will average about 10 percent better for their business. Prospects were apparently best in the West, where firms answering felt that their output would be up about 16 percent. Major factors governing this prediction were the increased volume of construction contemplated—mainly industrial, residential, and schools—and the feeling that a better public appreciation for ready-mixed concrete will give the plants a greater proportion of this volume. Translating these factors into increased output contemplated, a majority of the firms reporting from the midwest section say they will add to their equipment—mostly hauling units — and the average would indicate that upwards of 18 percent more equipment will be bought across the country in 1955.

Of those who reported that they would increase capacity in 1955, an average expenditure of $35,000 per company was estimated to be spent for this. Of the total estimated expenditures, two-thirds will be be spent by firms in the eastern or midwestern section of the country, mainly for new truck-mixer units, new plant bins or like improvements. Many new plants are now operating which were not included in past year statistics. Also, a considerable number of plants close each year. These are the plants located at points where economical operation could not be carried on, for one reason or another. This defection of the weaker plants and the continued operation of the larger plants, running more efficiently, seems to be the rule of the industry.

A portable batching setup, to handle urban paving from freight-car-siding locations, is a factor to be evaluated by any ready-mixed concrete producer, as such installations by contractors may mean the difference between profit and loss for the producer who is faced with such a situation. The tenor of the remarks from returns regarding future operations generally follow the construction trend of the region, which is more or less governed by the population growth. A fair estimate as to

View taken during the construction of a typical ready-mixed concrete plant.

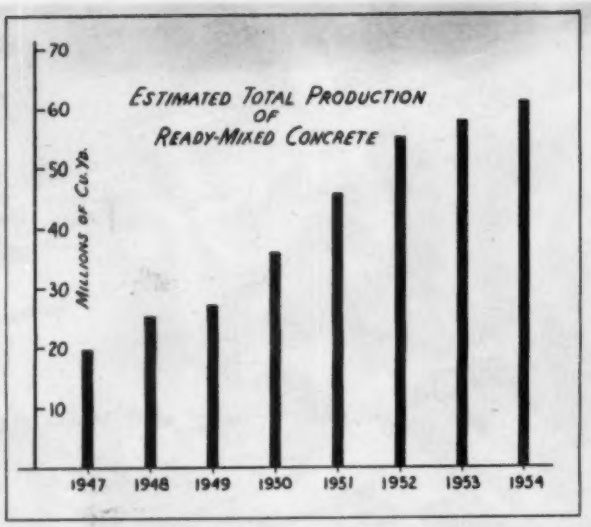
the annual demand from a plant is 1 cu. yd. per person within the area of coverage. There are many ready-mixed concrete plants which are over-equipped, and consequently suffering from burdensome overhead, because this simple appraisal of demand was not made prior to installation of equipment and hauling units.

Other items found in the remarks of producers regarding their future operations are: the doubling of the highway budget planned by President Eisenhower for 1955-1965 will help them only slightly; the local volume of construction within their area of operation is the primary factor influencing plant or equipment improvement; the annual practical depreciation of rolling equipment has about stabilized at 7 to 8 years of use, resulting in a 13 percent replacement per year.

Type of Operation Returns indicate that upwards of 90 percent of all plants are using transit mixing in their operation. The remaining plants use 6 percent central (plant) mixing and 4 percent use a combination of the two systems. The trend in the newer plants seems to be toward the installation of plant mixers as well as proportioning setups, to permit both types of service. On a geographical division, the East reported 94 percent transit mixing, the South 92 percent, the Midwest 87 percent and the West 78 percent. The number of plants operated by the companies reporting was fairly uniform, midwestern producers averaging 1.63 plants per company, eastern 1.60, southern 1.50, and western 1.44 plants, with the average for all areas of 1.57, as previously stated.

Hauling Equipment The number of truck units operated by the reporting companies increased about 10.4 percent during 1954. There was a wide variation in this figure in the various regions, the greatest increase being reported from the East where 17.9 percent more units were operated than in 1953. An increase of 11.3 percent was shown in the South, 8.7 percent in the Midwest, and a reported decrease of 1.0 percent was reported in the West.

The average truck capacity in cu. yd. per unit in all areas increased 2.7 percent during the year, from an average of 4.38 cu. yd. in 1953 to 4.50 cu. yd. in 1954. Truck capacity increased most in the South, where the average size increased 4.7 percent, from 4.13 cu. yd. to 4.32 cu. yd. The Midwest reported truck size increasing 2.4 percent, from 4.12 cu. yd. to 4.22 cu. yd. The East, using the larger-sized units had an increase of 1.6 percent, sizes increasing from 5.05 cu. yd. to 5.13 cu. yd. In the western plants truck size increased 1.2 percent, from 4.77 cu. yd. to 4.83 cu. yd.



The number of truck units per plant for all companies reporting was shown to be 7.5 units in 1954. The average breakdown by divisions was: East 9.9 units, West 7.7 units, South 7.1 units and Midwest 6.9 units. If the assumption were to be made that the same number of plants per company were considered in both years, this would indicate an average increase of 10.2 percent more units per plant in 1954.

Hauling Capacity Total truck-mixer capacity, in cu. yd. per plant reporting from all areas, increased from 29.8 cu. yd. in 1953 to 33.9 cu. yd. in 1954, an average increase of 13.7 percent. Regionally, these average capacities were from 42.3 cu. yd. to 50.7 cu. yd. in the East, from 34.8 cu. yd. to 34.9 cu. yd. in the West, from 26.4 cu. yd. to 30.7 cu. yd. in the South, and from 26.3 cu. yd. to 29.3 cu. yd. in the Midwest plants. Again, the same assumption can be made, that the same number of plants per company existed in both years.

Total truck-mixer capacity, by percentage, in cu. yd. per company reporting operations in both years, increased an average of 13.4 percent from 1953 to 1954 in all areas. The variations geographically were from 19.8 percent increase in the East, 16.3 percent increase in the South, 11.3 percent in the Midwest, to the minimum of 0.2 percent in the West.

Selling Prices The average selling price per cu. yd. of ready-mixed concrete delivered to job site, as reported by all companies answering rose from $12.67 charged in 1953 to $12.97 per cu. yd. obtained in 1954, representing a 2.4 percent increase. Sectional average selling prices were: South from $12.86 to $13.34 (3.7 percent); East $12.83 to $13.11 (2.2 percent); Midwest 12.62 to $12.86 (1.9 percent); West $12.23 to $12.41 (1.5 percent increase.) This average value per cu. yd. as of the end of 1954 is slightly above that shown by the industry survey conducted by the National Ready Mixed Concrete Association (the results of which survey were published in the CONCRETE MANUFACTURER in June, 1954) which indicated an average value of $11.92 per cu. yd. for 1953. This very excellent survey covered a large segment of the industry, but did not present comparative data from the same plants for different years of operation, so no direct, accurate comparison can be drawn for any of the many items listed therein. The selling price of ready-mixed concrete shown for the southern plants for both '53 and '54 is the highest of any concrete prices in the country, and has also had a greater yearly gain than any other average price. The current increase is in accordance with increases in prior years.

Hourly Wages The average hourly wages paid in the industry, as reported, rose from an average of $1.56 per hour paid in 1953 to $1.63 paid in 1954, which represented a 4.5 percent general increase over the country. Sectional average wages paid were as follows: West from $1.88 paid in '53 to $1.94 in '54, an increase of 3.2 percent; East $1.65 to $1.74 (5.5 percent); Midwest $1.64 to $1.72 (4.9 percent); South $1.16 to 1.19 (2.6 percent). As previously reported, highest wages prevailed in the western and lowest in the southern plants, although the highest increases occurred in the eastern plants reporting. This pattern follows the per-

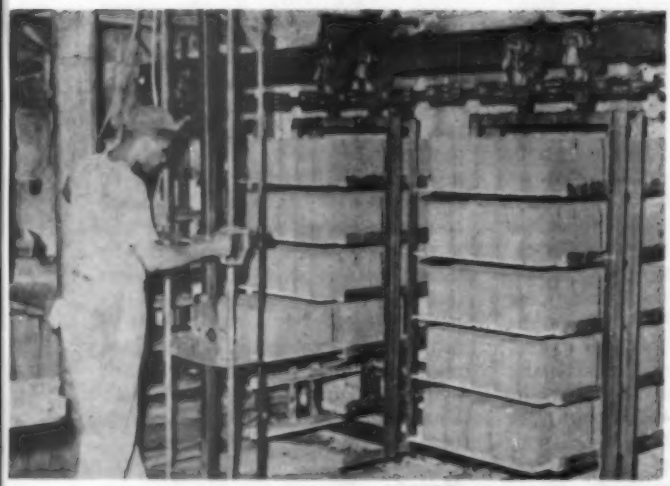
(Continued on page 274)

Monorail Featured in

From the Allco's Stinson plane, a passenger gets this view of the Ferrer block plant at East Patchogue, Long Island. Note the cement car and bin in the background.

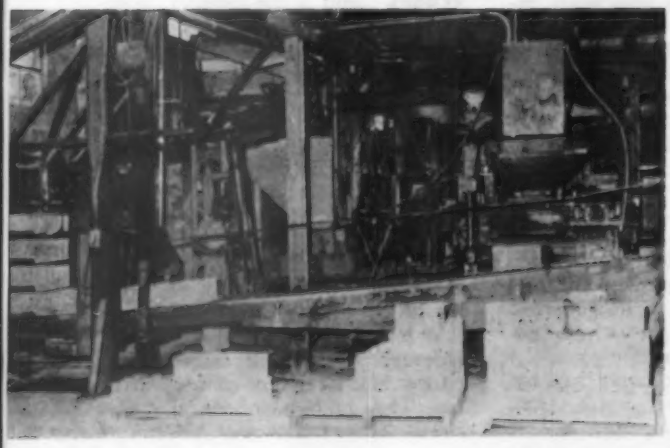
AT East Patchogue, Long Island, N. Y., Russell Ferrer, who has been in the concrete block business for 32 years, and his son, Russell Jr., have designed and now operate an almost completely automatic block plant which can run continuously without stops for cooling and heating the kiln. Their non-stop facility, the Allco Concrete Products Company, could be operated 24 hours a day, if the demand arose, with only short interruptions for maintenance of the machinery. The system operated by Mr. Ferrer and his son saves time, equipment, money, and manpower.

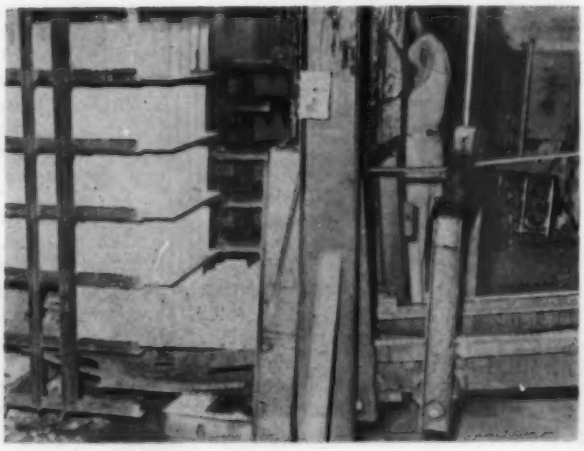
The main feature of the plant is a 360-ft. monorail which was manufactured and installed by the Jervis Webb Company of Detroit, Mich. It is the same type of monorail used in automobile manufacturing to hang car bodies during the paint heat treatment. The monorail at the Allco plant carries blocks produced by a three-block Columbia 12 machine. The blocks are removed from the machine on two pallets—each bearing three 8- by 16-in. equivalents—and transferred to the rack by a Columbia hydraulic off-bearer. According to Mr. Ferrer, the blocks could be moved automatically to the rack, but a man is needed at this point in the operation to inspect the quality of the blocks. The rack itself is suspended from two trolleys which are attached to the 6-in. I-beam mono-



Left: This closeup view shows the monorail, the drive chain, and the trolleys supporting the racks. Loading of racks is done by hydraulic off-bearer.

Below, left: Here the automatic unloading conveyor is taking a tier of cured units off the rack coming out of the kiln, and setting these on the track for handling in cubing (foreground).





Closeup of automatic unloading conveyor taking the lowest tier of cured blocks from the rack coming out of the kiln.

Conveyor and Continuous Curing Non-Stop Block Plant Operation

By FITZGERALD C. SMITH

rail. It has six decks, each capable of holding two pallets, for a total capacity of 36 8-in. blocks.

There are 89 racks suspended from the 360-ft. long monorail system. The drive chain which moves the racks along the monorail is driven by a 3-hp. General Electric gear-head motor having a ratio of 125 to 1. At this ratio the drive chain is capable of pulling an 8,000-lb. load at the rate of one foot every minute and a half, the pace at which the racks usually travel through the kiln. This rate of travel can be adjusted to the output of the Columbia block machine.

The loaded racks—spaced 4 ft. center-to-center—move slowly into the kiln. No door is used, as the loaded racks traveling at a snail's pace, prevent the steam from escaping through the narrow kiln entrance. The kiln room is 20 by 85 ft. in size and 8 ft. high. The blocks remain in the curing room for four hours. This means that when the crew is working on 8-in. blocks, the kiln has 3,200 units in it, with 800 units an hour coming out on the monorail. The kiln uses only a low-pressure 50-hp. Kewanee Scotch boiler, while most plants of the same size would use about a 150-hp. boiler.

As the racks carrying palleted block come from the kiln on the monorail, an unloading conveyor automatically takes the pallets from the racks. At this point in the system manual labor is used for the first time. (The off-bearer operator is kept on as an inspector.) Russell Jr., who incidentally gained most of his basic mechanical knowledge in the Army as an electronics expert, is now at work on a plan to make even the unloading operation automatic. Two men are needed to take the blocks from the automatic unloading conveyor and cube them. A Hyster Model 40 fork-lift truck takes the blocks to the storage yard. Aside from the time saved in its continuous operation, this system, in operation since May, 1953, has saved the labor of three men—the fork-lift truck operator who formerly carried the blocks in and out of the kiln, a man who handled pallets, and another man who was needed in the cubing operation.

The Allco plant produces an average of 8,000 8-in. units during a 10-hour day with a crew of five men. The plant is also a model of economy and efficiency in other procedures.

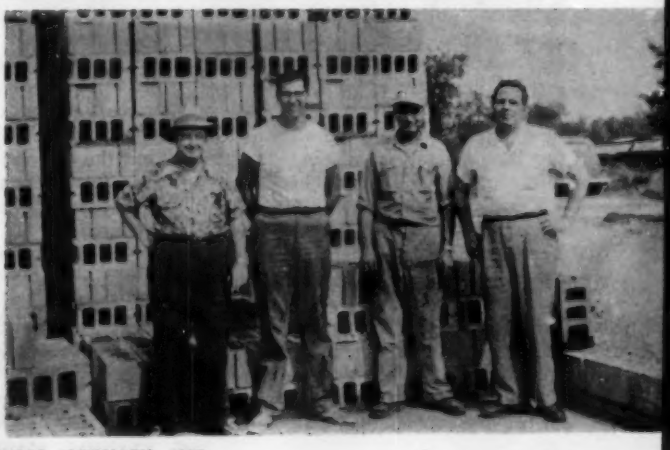
Mr. Ferrer's present plant differs considerably from the one he started with in 1922 in nearby Mastic, where he had an Ideal downface machine with a capacity of 200 blocks a day. As a long-time resident of Long Island, knowing the market, he expanded with the residential building boom there, carefully selecting his machinery for the necessities of the current market. In 1935, when he moved to East Patchogue, he used a one-block Anchor stripper machine with a 1,200-per day, 8-in. block capacity; after that came two Kelly machines, each with a 2,000-per day capacity. In 1950 he got his first Columbia, the two-block machine, which he operated along with one of the Kellys; and in 1953 he installed the present three-block Columbia 12.

As he increased his machine capacity, he also streamlined his cement and aggregate operation. Cement is brought in by bulk freight car shipment from the Lehigh Portland Cement Company, Alsen, N. Y., and the Alpha Portland Cement Company, Jamesville, N. Y. High early strength, air-entrained cement is used. A Fuller-Huron 8-in. Airslide removes the cement from the hopper-bottom freight cars. The cement drops from the car hopper onto a stationary canvas belt. Once it is aerated by the Airslide, it flows like water for about 25 ft. on the belt runway to the cement elevator, which carries it up 50 ft. to a 700-bbl. Butler storage bin. In this operation 100 bbl. can be unloaded in an hour; an automatic horn device sounds a warning when the bin is full. This warning enables an operator to shut off the Airslide elevator and prevents overloading of the bin. The Airslide is supplied with aid by a Root-type blower powered by a 5-hp. General Electric motor. Another Airslide conveys the cement 50 ft. to a Myers scale. Russell Jr. has installed an electronic control that automatically shuts off the Airslide under the freight car when the one going to the scale is in operation.

The Ferrers have also designed and installed an efficient system for handling their aggregate. The sand is hauled 2 miles from the Bellport Sand and Gravel Company, a subsidiary of Allco which is managed by Russell Jr. The sand-pit, which uses a 1-cu. yd. Allis-Chalmers loader on tracks and a Bucyrus-Erie crane with a ¾-

(*Continued on page* 260)

The cubed blocks are being transferred by high-lift truck to outside storage.



Posing before an appropriate background are (left to right): Russell Ferrer; Russell Jr., his son; Roy Kroos, plant superintendent; and John Havens, office manager.

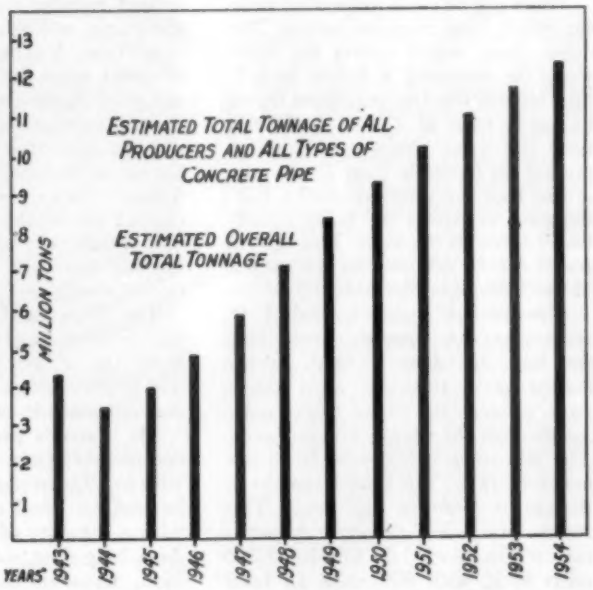
CONCRETE PIPE
Maintains Normal Volume in 1954

Prospects for future depends upon construction trend

By ROY L. PECK

IN 1954 the concrete pipe industry experienced another year of high-level activity, producing about 12,300,000 tons of all sizes and types. This record production was about 5 percent above the amount shipped in 1953. When our survey of the industry was made a year ago, even the most optimistic producers were hesitant to predict another banner year, and accordingly, our estimate that the year's production of 11,000,000 tons was about the same as in 1952 was about 6 percent too conservative. As more accurate production figures are now available it is felt that this explanation is necessary to set the record straight. The last two years have seen a transition from the "seller's market" to a "buyer's market", with the consequent leveling off of production inherent with this type of change. It has been a period of hesitation for producers, which lasted until the continuing construction volume brought back confidence, assuring them that the national economy was not turning down and that continued prosperity in the industry was ahead for those who could intelligently interpret the signs.

The factors to be appraised if the industry is to prosper have been in the making for some time in the past. Some of them were brought into national prominence in 1954. That year, launched amid great pessimism and fear of catastrophic war, sudden drop-off in business and construction volume, with the consequent application of controls sealing most of the industry's activity, proved in many ways the antithesis of the earlier feelings and fears. A new system of selling the discriminating buyer came into being and the sales volume went up. Competition stiffened within and without the industry and in the shaking down period which followed, many new faces were seen in old and new companies. An evaluation of the industry had long been made by shrewd business men, and 1954 witnessed several influxes of new blood in the way of outright purchase of control of some of the key increments of the concrete pipe industry. As the year progressed, confidence returned and the industry ended 1954 with more volume of business than it had ever had in any preceding year. In effect, meeting the challenge of change has been healthy.



Road building is now entering a new era of expansion, and must continue to gain momentum started in 1954. Highway construction requires concrete pipe in large quantity. Coincident with this expansion is the vast housing program, including new sewer systems and sanitation demands, the latter no way near satisfied. A big program requiring large quantities of drainage and irrigation pipe has been launched by the government, extending to all parts of the United States rather than only to the western portion, as is in the past. Vast projects are in the planning stage, to eliminate the dangers and nuisance of pollution and unchecked flood waters. A good portion of the dollars in the cost of these anti-pollution programs will end up in the pockets of the concrete pipe manufacturers.

During 1954, hydraulic roughness coefficients were brought up to date in several government offices. Concrete pipe lines now have smoother interiors and joints than ever before, but the old coefficients had remained and been erroneously accepted for many years. Full-scale tests on corrugated metal pipe at the Bonneville Dam by the Corps of Engineers and the Navy resulted in the acceptance in the spring of 1954 by these agencies and the Bureau of public Roads in friction coefficients which will guarantee the most economical design of future pipelines. The year also saw the confirmation of the findings of Dr. Straub of the University of Minnesota on the coefficient of head loss for various inlets on culverts. The low comparative loss with concrete pipe inlets should result in a greatly increased use of concrete.

Pipe are now being produced which will stand much heavier loadings than the present A.S.T.M. loading limits. In 1954 a project was initiated in Washington, D.C. to establish on a national basis the heights of fill which may be put over concrete pipe according to the method of installation utilized. Tests in which various arrangements of shear reinforcement at top and bottom more than doubled the strength of large diameter pipe, were reported at the annual meeting of the Highway Research Board in Washington in 1954. Other new designs are now being worked on by other bodies. Improved construction techniques were developed in 1954 which promise a bedding and backfilling job which will do full justice to the inherent strength of concrete pipe. The dissemination of the knowledge that concrete pipe has superior hydraulic characteristics, proved by research at Tulane University during several years of study, has been continued in 1954. Further study of its

(*Continued on page* 265)

COLUMBIA MACHINE

"Thank You..."

FRED NETH, President
COLUMBIA MACHINE

It was only 12 months ago that Columbia announced a revolutionary development in concrete block machines...a new machine that will cast an unlimited variety of 12-inch-high shapes, as well as all standard shapes in 8-inch and 4-inch heights. In the ensuing year, the concrete block industry has justified our original conception by its enthusiastic reception of this machine. Aware of the great responsibility which this interest imposes upon us, we promise the continued production of superior machines, and the continued introduction of advanced equipment that will add to the prosperity and prestige of the entire concrete block industry.

Fred Neth

Columbia Machine will be represented at the NCMA convention in Cleveland, January 24, 25, 26 and 27 by many of its officers and by its sales and service representatives from nine regional offices. Meet them at Columbia's booths, Nos. 152, 153, 188 and 189; visit them informally in Suite 315 at the Auditorium Hotel.

Columbia 12"-High production includes concrete drain tile, water meter boxes, Roman tile, partition block, silo staves, flue liners; more than 240 shapes in regular 8-inch and 4-inch heights. Four to six cycles per minute on standard plain pallets.

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NOW another Challenge 1st for positive control and efficiency

CHALLENGE *perfects the new*

MIXOMETER

. . . an exclusive standard feature of all CHALLENGE *Pacemaker** Truck Mixers

Now for the first time in the industry, ready mixed concrete producers have an accurate method of controlling the quality of the concrete . . . after it leaves the plant.

This outstanding Challenge development, the "Mixometer", tells the operator at a glance:

1. **How Fast The Drum Is Revolving Per Minute.**
2. **Proper Drum Speeds For Charging, Mixing and Agitating.**
3. **How Many Revolutions The Drum Has Turned per Trip.**
4. **Running Total of Drum Revolutions During Life of The Mixer.**

With the "Mixometer", the operator can always be sure that the drum is turning at the proper speed for producing the best concrete for the job. There's no guesswork . . . nor compromise!

Another Challenge First! The "Mixometer" is another example of Challenge leadership in truck mixer engineering, design and performance. Your nearby Challenge Dealer is ready to demonstrate the "Pacemaker's" superiority on your job.

Make arrangements for a demonstration TODAY!

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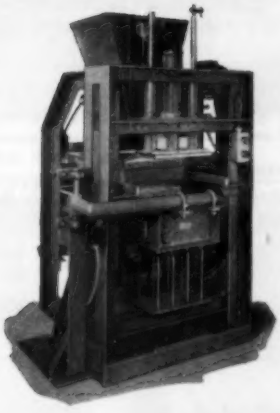
Plain Pallet Automatic
Block Machine



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Lintel Machine with
Aggregate Hopper

Automatic Continuous Mixers in Various Capacities

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CUYAHOGA FALLS, OHIO.
CONCRETE PRODUCTS MACHINERY SINCE 1925

CANADIAN DISTRIBUTOR: Wettlaufer Equipment, Ltd., 49 Merton St., Toronto 12, Ontario

Advantages of Gradual Conversion To Autoclaving Operation

By WILLIAM J. SHORE
Engineering Consultant

FOR the average operator of a concrete products plant contemplating a change in the method of curing, two possibilities arise. The installation of high-pressure, high-temperature steam curing, or autoclaving, can be made in a series of stages, spread over a number of years, or the conversion of the entire production can be completed at one time. The situation with which the owner of the plant is faced in the latter instance is quite complex and may produce reactions in the trade that would be a source of serious concern to him.

Autoclaving systems have the following advantages: they produce blocks that have lower volume changes in the wall; they usually require a lower cement factor—that is, more units are obtained per sack of cement; and units so cured approach full strength in 24 hours. These three characteristics create a product of superior quality at a lower unit cost, and shorten processing operations. And yet, high-pressure autoclave installations today constitute less than 0.5 percent of the total number of block plants in operation. This is due chiefly to the fact that the installation cost of autoclave curing is beyond the economic capacity of the average producer.

To build an autoclave plant for the production of 7,000,000 units (8-in. equivalent) per year would cost approximately $250,000. If only 2,000,000 of these units were cured in the autoclaves of this plant, the cost of this part of the operation would be $71,500, or two-sevenths of the total cost. To set up a new autoclave assembly for producing the same 2,000,000 units annually would cost close to $75,000, or only 5 percent more than the cost of producing the same partial volume in the large plant initially costing $250,000. This example may indicate that it is more feasible economically to start autoclave curing on a small scale, for only a portion of the total production of the plant, than to invest a much larger sum at the outset of operations.

The accompanying table shows the approximate installation costs of one autoclave and two autoclaves, of three different lengths of drums, when used in two- or three-cycle operations. In each of the costs given for one-drum equipment, the cost of

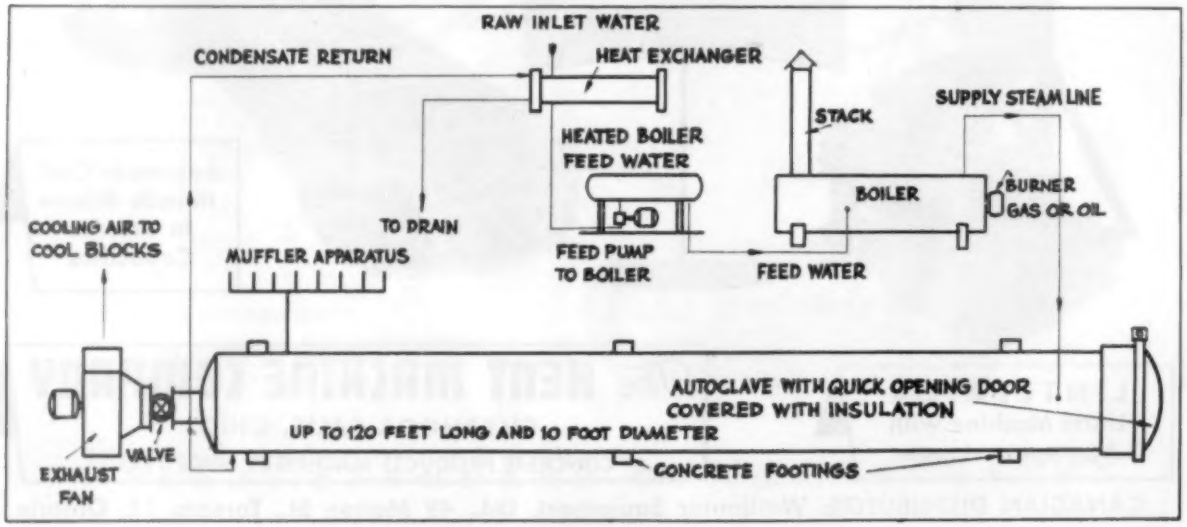
APPROXIMATE INSTALLATION COSTS OF ONE AND TWO AUTOCLAVE HIGH-PRESSURE STEAM-CURING SYSTEMS

Number of Autoclaves	Length (Feet) of 8-ft. Dia. Autoclaves	24 Hr. Output of 8-in. Equiv.		Approx. Total Installed Costs[3]
		2 Cycles[1]	3 Cycles[2]	
1	70	3,000	4,500	$35,000
1	92	4,000	6,000	$41,000
1	113	5,000	7,500	$45,500
2	70	6,000	9,000	$54,500
2	92	8,000	12,000	$63,500
2	113	10,000	15,000	$71,250

[1] 2-Cycle Operation—
1. Steam turned on at 8 a.m.; steam turned off at 3:30 p.m.
2. Steam turned on at 5 p.m.; steam turned off at 6:30 a.m.

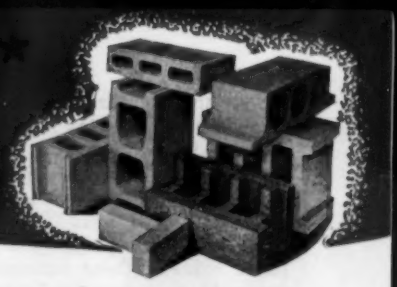
[2] 3-Cycle Operation—
1. Steam turned on at 8 a.m.; steam turned off at 2:30 p.m.
2. Steam turned on at 4 p.m.; steam turned off at 10:30 p.m.
3. Steam turned on at 12 midnight; steam turned off at 6:30 a.m.

[3] Approximate installed cost includes: autoclave or autoclaves with quick-opening doors; gas-fired high-pressure steam boiler; exhaust and cooling systems; muffling and heat recovery systems; instruments and controls; insulation; all steam, water and gas piping, rigging autoclaves on supports; all engineering services, including plans and specifications, purchasing of equipments, supervision and direction of installation at plant site.



Layout of modern autoclave-curing installation, showing schematic location of steam production units and ventilating apparatus.

Another BESSER Booster*



★ This is the 115th of a series of ads featuring leaders in the Concrete Products Industry who are stepping up block production with Besser Vibrapac machines.

4 Jensen Brothers Unanimously Endorse VIBRAPACS for Concrete Block Plants

The Jensen Block & Supply Company of Racine, Wisconsin began to make concrete block in 1928. Their first Besser machine, a K-3 Tamper, was installed in 1939. Then came the Besser Vibrapac, in 1947, and this machine is still giving them excellent service.

The Jensen plant is being operated by four brothers. All four are of the opinion that the Besser VIBRAPAC is the "best machine on the market". Why? Because the VIBRAPAC has practically *no downtime*. It operates day-in and day-out, thereby assuring maximum volume production.

The Besser VIBRAPAC can do the same for YOU. Get the facts! Write today for literature.

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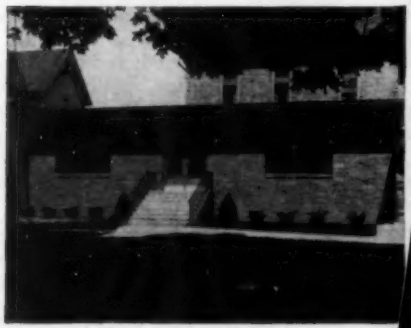
Complete Equipment for Concrete Block Plants

The Jensen executive team — brothers Roy, Paul, Ken and Harold.



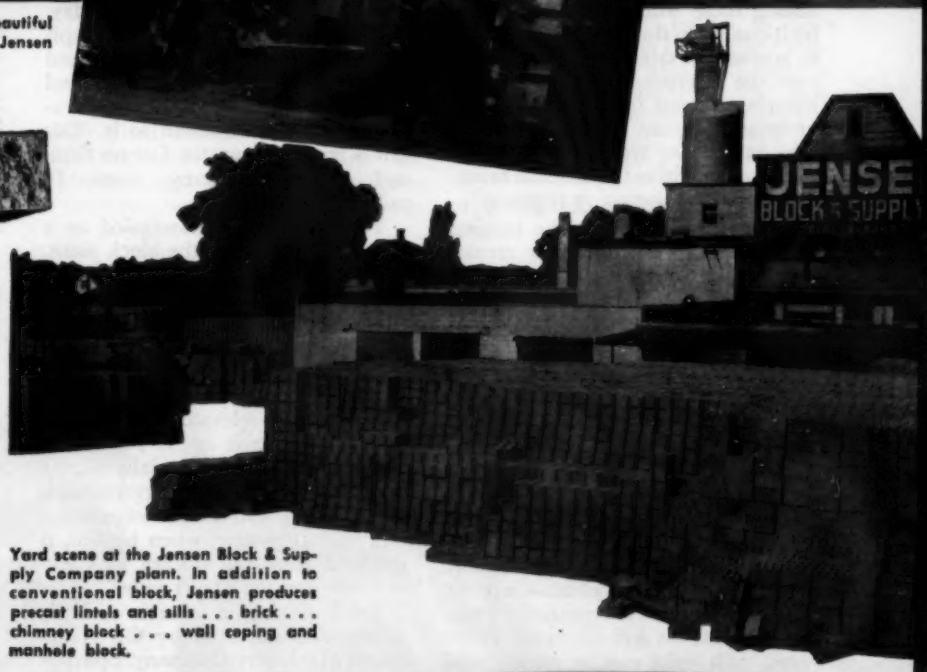
Funeral Home in Racine built with beautiful BES-STONE Split Block produced at the Jensen Block and Supply Company plant.

The Besser Vibrapac installed at the Jensen plant. More than a million block (8" equivalent) were produced during the past 12 months.

BES-STONE

The Split Block with Character

The Jensen plant recently installed a BES-STONE Block Splitter to meet the ever-increasing demand for BES-STONE — the split block with a quarried stone appearance. It combines beauty with permanence, at low cost.



Yard scene at the Jensen Block & Supply Company plant. In addition to conventional block, Jensen produces precast lintels and sills . . . brick . . . chimney block . . . wall coping and manhole block.

BESSER
50th Anniversary
1904-1954

A Half Century of Concrete Masonry Progress!

the steam-generating equipment included is sufficient for an additional drum to be installed at a later date. Very nearly all block plants fall within the production range of from 4,500 to 15,000 units (8-in. equivalent) daily. If production in any plant exceeds these amounts, it is recommended that duplicate installations be made, rather than originally installing larger steam generating units than the 300-hp. boiler suggested here. With units larger than this many disturbing factors and complications are introduced.

If there is interest in autoclaving, it is not necessary to wait until a large sum is available. A more modest start, with perhaps a production of 6,000 units daily is economically sound. The autoclaved output may be only a fraction of the total production of the plant, and the producer has the opportunity of test-merchandising this partial production over a pre-determined period. Such a procedure is better than trying to sell 100 percent autoclaved units, as he would have to do if a total changeover in curing were made.

A small installation of autoclaving equipment also permits ample time for necessary experimenting, for tests, trials, and many other details of performance so necessary to perfect any new process.

He has more time to promote the sale of this product of superior quality along with his regular output. He can develop new customers from among those whose projects require high quality in the units. He has time to spread his sales messages and secure the incorporation of his special autoclaved units in specifications. If necessary, he can enlarge his sales area as his new type of units would not be competitive for the time being.

Where a complete changeover to autoclaving takes place, the ensuing competitive situation usually creates serious difficulties for management. Local competitors immediately take action, since they know that conventionally cured block cannot compete with autoclaved units. Generally, competitors drop their price one-half cent under the price quoted for autoclaved units, in an endeavor to maintain their market.

On projects where quality is not of great moment—such as in residence foundations, in wall back-up, and in speculative building normally allowing the builders to make a profit on small price differentials—autoclaved units are difficult to sell. However, such units can be readily sold if the quality of the unit is primary, and if price, while not entirely secondary, is of lesser moment. Such projects include government installations and state and municipal construction such as hospitals, schools, and institutions. On this type of project a superior product is welcomed, and to make sure that they are used, specifications will generally definitely name them. A superior type of merchandising effort is required to solicit such trade, and to insure that specifications call for high-pressure, high-temperature steam-cured block. Until the block producer has succeeded in selling prospective users on autoclaved blocks, competition will be severe. Once this gap has been bridged, the sale of autoclaved units follows a normal course, with the minimum of outside competition.

The producer who installs autoclaves in successive stages is not under the pressure faced by the producer who makes the complete conversion in one operation. He still operates his old kilns and heating system, and takes no loss on this equipment, which still has use and value. If total conversion is completed in one step, a substantial loss may occur from scrapping old equipment. Once the complete autoclaved output is being sold, it is feasible to install one unit—perhaps two—to meet prospective future demand.

When expansion in any plant is contemplated, it may be advisable for the producer to autoclave all additional production planned. In so doing he does not disturb the regular routine of his ordinary block production, and retains the business of his old customers. He has an additional output of several thousand units daily which are of superior quality. With these he can seek a market for autoclaved units, with full assurance of establishing closer and more profitable contacts. If insufficient projects demanding quality block exist within his prior selling areas, he can with profit travel farther afield to sell his special product in these new areas.

A very high percentage of the block plants in this country have been built up from modest beginnings, a goodly share of the profits being put back into the purchase of better and more modern equipment from time to time. That same conservative and successful method can be used in the installation of high-pressure curing systems, by successive stages not requiring investments of hazardous proportions. Local sales of conventionally cured units are not materially affected, and no intense or otherwise severe period of price-cutting is created. A new product of superior quality is offered; and in short order new buyers will be found who seek quality and are willing to pay for it.

Monorail

(From page 253)

cu. yd clamshell bucket, has an output of about 480 cu. yd. per day. About half the production of the pit —which turns out minus ½-in. and 1½-in. gravel—is sold. As the sand is too fine for the block plant operation, grit must be added to it. This grit is trucked from the Corum Sand and Gravel Company, about 10 miles from the plant.

The aggregate is stockpiled in a one-acre area beside the block plant. Running under this stockpile is a reclaiming tunnel with 14 gates discharging on the 18-in. by 165-ft. reclaiming belt conveyor. Each gate has a Cleveland vibrator to insure steady feed. The conveyor runs to a separate aggregate elevator that carries the sand and grit up 40 ft. to bins built by Mr. Ferrer especially for the operation. Each of the aggregates is stored in its own 20-cu. yd. storage bin. The aggregate, when needed, is dropped from the storage bins several feet into the Myers scale.

Batch mixing is done in a Kelly mixer, manufactured by the Wittemann Machinery Company. Spay-O-Bond is used as an additive. From the mixer, a Stearns skip hoist with a 1-cu. yd. bucket transfers the mix to the hopper of the Columbia block machine.

Allco uses four Ford trucks and an International tandem in making its deliveries within a 50-mile radius. Russell Jr., flying a four-passenger Stinson plane, takes his father on business trips and makes quick hops for spare parts in an emergency. The plant superintendent is Roy Kroos, and the office manager is John Havens.

Arthur Ruettgers, who was formerly head of the Bureau of Reclamation laboratories in Denver, died recently at the age of 65 years. He was widely known for his work in concrete control techniques, and directed the Denver laboratories during the period of study for structures such as the Hoover and Grand Coulee dams.

Dominion Tar and Chemical Company Limited, Montreal, has acquired the rights to Swedish patents from International Siporex of Stockholm to make "foamed concrete" in Canada. There is an increasing interest in Canada in lightweight concrete construction.

Ready-Mix Plant in Iowa Features Automatic Controls And Generous Storage Space

Truck mixers lined up at the plant of the Ready Mix Concrete Company, Sioux City, Iowa. In background are the aggregate truck loading bin and the ground storage.

another P&Q exclusive

In making editorial trips throughout the country, one occasionally encounters an operation which is outstanding even among the many excellent plants in the industries we cover. Such a concrete central mixing plant is operated at Sioux City, Iowa, by the Ready Mix Concrete Company. It has many features, most of which contribute to efficiency and economy of operation. It is highly mechanized and automatic wherever practicable, and every precaution has been taken to guard against shutdowns. As a result, only four men are required to operate this plant at full capacity. These include one man on aggregate unloading, one on aggregate feed to the plant, one on cement unloading and feed, and one on the batcher floor.

By WALTER E. TRAUFFER

This company was formed in 1941 as a corporation composed of L. G. Everist, Inc., the Bellamy Sand and Gravel Company, Jensen and Krage, contractors of Sioux City. It took over the interests of the Everist firm, which had been in the ready-mix business there since the early 20's. The original truck fleet consisted of five old bath-tub bodies. The agitator trucks were purchased in 1944. This fleet has now grown to 15 agitators—four 4½-cu. yd. Rex units and 11 3-cu. yd. Rex units, all mounted on International truck chassis.

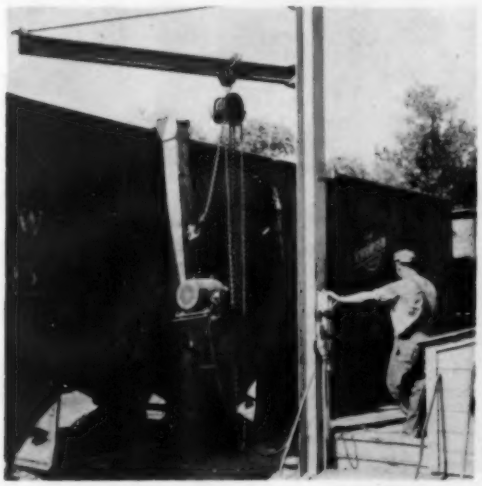
The original plant was at 2020 E. Fourth St., a very convenient location, but one which unfortunately lacked room for expansion. As a result, property large enough to meet all possible future requirements was bought at 1221 North Steuben St., a few miles from the old site. A completely new plant was built there and was put into operation in July, 1952, at which time the old plant was discontinued.

Standley & Company, Inc., St. Louis, Mo., was awarded the contract to design and fabricate the plant, which was erected by the ready-mix company's own forces. It was specified that the plant should be an economical operation, mechanized to the greatest possible extent, and that it should have a capacity of 900 cu. yd. daily. The capacity of the old plant was 300 cu. yd. The Standley firm supplied the bins, batchers, belt conveyors, bucket elevators, screw conveyors, and other equipment.

Summarized, the main features of the plant include: rapid unloading of aggregate from cars, large and flexible yard storage of aggregates, large reserve storage of cement, automatic controls on nearly everything, remote control of equipment difficult of access, almost complete elimination of manual labor, etc. The entire electrical setup, for example, has a magnetic contactor and master switch for each motor. As a result, when any motor is overloaded, it automatically shuts off, saving expensive repairs.

Every possible precaution was taken to prevent expensive shutdowns. The plant was just well under way in its first full year of operation when on June 8, 1953, the record flood of the Floyd River inundated the entire area to a depth of 13 ft. at the plant site. The water rose and fell rapidly, but it did considerable damage. The entire crew

The car shaker, which makes it possible to unload a car of aggregates in 10 to 15 minutes.



The aggregate storage and reclaiming system, with the plant in the background shown before it was enclosed.

Left: Another view of plant, showing the cement hopper cars on the unloading track and the elevator to the silos and plant storage.

Right: Some of the signal and control equipment at the aggregate reclaiming tunnel includes (right) the radio compass controlling the turn spout to the plant bins.

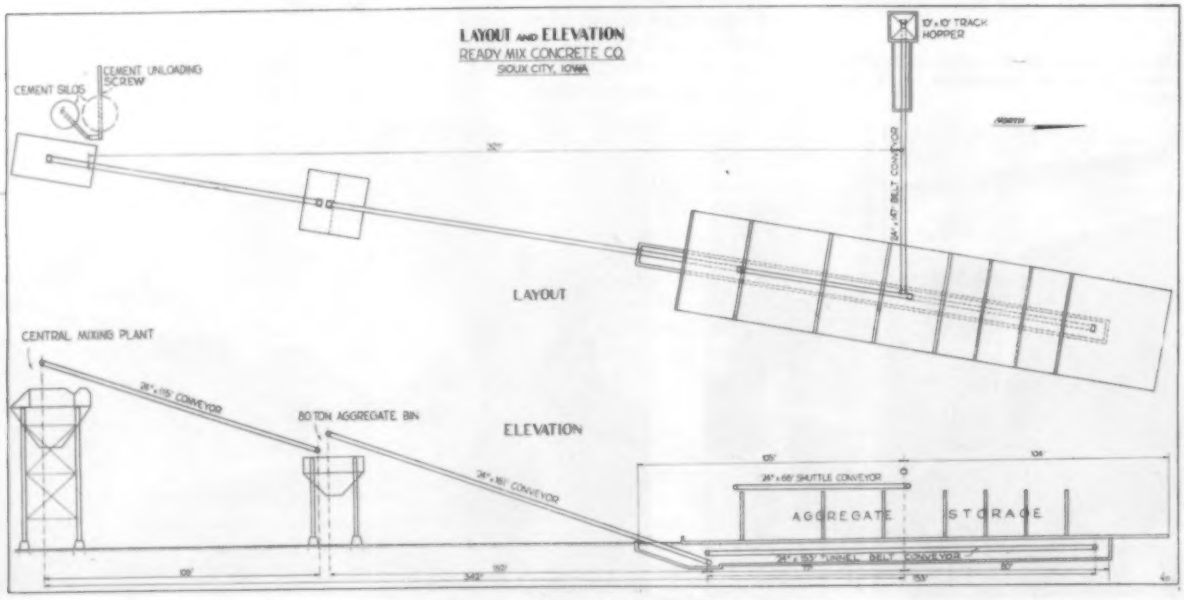
worked on cleaning up the property, with the result that the plant was out of operation for only 8 days. Just as operations again got well under way, there was a drivers' strike.

Most of the concrete is made with sand and gravel, half of it coming from the Everist plant at Hawarden, Iowa, and half from the Correctionville plant of the Concrete Materials Company. A growing amount of quartzite rock is being used for paving, driveways, etc. This material comes from the L. G. Everist plant at Dell Rapids, S. D. This ready-mix plant is said to be the only one in the city and its suburbs, and deliveries are regularly made up to 20 miles—in rare instances up to 40 miles. There is a growing farm demand for ready-mix for corn cribs, barn floors, etc.

All aggregates and cement are received in railroad cars on a siding. A car puller can move up to 12 cars at one time. The aggregate cars are unloaded in 10 to 15 minutes, with the aid of a National car shaker, into a 25-ton track hopper. Clamshell gates control the discharge onto a 24-in. by 147-ft. belt conveyor, inclined at 17 degrees, which in turn discharges onto the cross shuttle belt conveyor distributing the aggregates to storage. This 24-in. by 68-ft. conveyor is on a frame which travels on rails on a 128-ft. track supported on the concrete partitions of the ground storage system. The traveling frame is chain-driven through a geared-head electric motor which receives its current through trolley wires and is push-button controlled from the track hopper. It can be stopped at any desired point, so that material can be stored the full width of the pile.

Eight sizes and types of aggregates are being stored. These and the capacities of their compartments are as follows: special sand for government work, etc., 500 tons; plaster sand, 500 tons; concrete mix, 500 tons; granite rock, 500 tons; 1½-in. gravel, 1,000 tons; ¾-in. gravel, 1,000 tons; concrete sand, 1,000 tons; granite chips, 500 tons. An International track-type tractor with a Hough shovel attachment rehandles material to and from dead storage.

Two lever-operated clamshell gates under each pile feed onto a 24-in. by 153-ft. reclaiming belt conveyor in a concrete tunnel under the piles. This conveyor discharges on a 24-in. by 161-ft. inclined belt conveyor which in turn discharges through a split chute, controlled from ground level, either into an 80-ton C. S.



Johnson bin for loading aggregates into trucks or onto the second 115 ft. section of the conveyor to the top of the ready-mix plant. A turnspout, cable-controlled from the ground, discharges into the two compartments of the 80-ton bin. Johnson weigh batchers measure out the desired loads, which are then checked at the truck scales. At the top of the plant a turnspout can discharge the materials into any one of the six compartments of the Standley steel bin. There are two 65-ton compartments for sands and four 50-ton compartments for 3 sizes of gravel and one of rock.

The turnspout is controlled from the aggregate tunnel by means of a radio compass with a Selsyn-motor-operated table. This is the same type of system that is used on a battleship or with field artillery to aim all guns at a certain angle; it has proved to be very accurate and dependable in this application. The plant bins are all equipped with upper and lower level Bindicators, and lights in the tunnel keep the operator informed as to conditions.

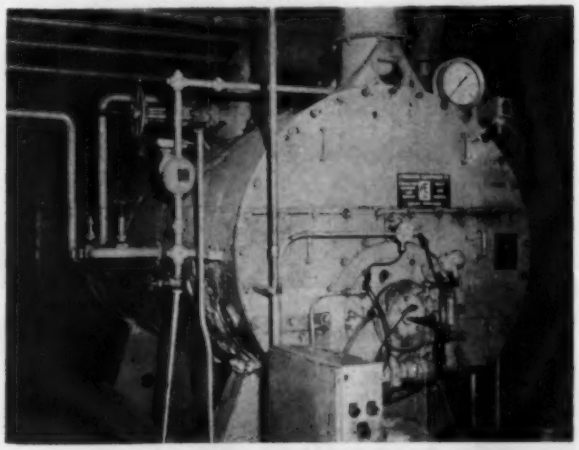
Bulk cement is received in special hopper cars which are unloaded by means of a 40 ft. under-track screw conveyor at the rate of 200 bbl. per hr. An 85-ft. bucket elevator discharges through gates and chutes, controlled by cable from ground level, either into the 2-compartment, 300-bbl. plant bin, or into the 1,200-bbl. and 600-bbl. reserve silos. The two plant compartments each have upper and lower level Bindicators, and the two silos each have three Bindicators, one at the halfway level. The half-level indicators make it possible to take accurate inventory every month. Each indicator is connected to a light at the unloading point, so the operator is informed of conditions at all times. The cement from both silos is reclaimed direct by the cement screw.

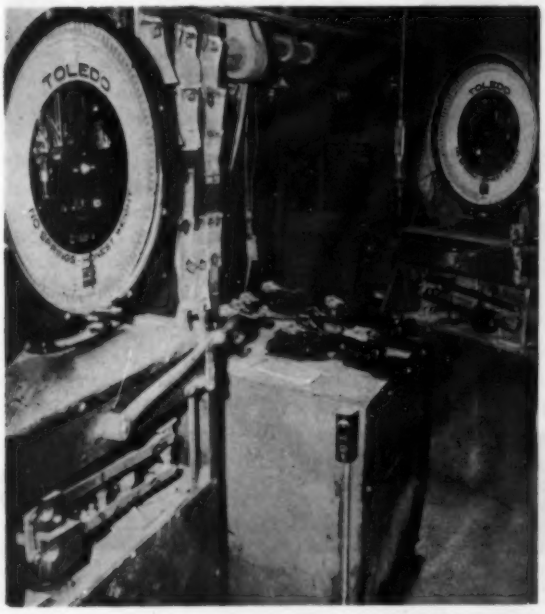
The batching setup in the plant is air operated but is manually controlled with the minimum of effort and a maximum of accuracy. Aggregates are discharged through clamshell gates operated by air rams into a Standley 4½-cu. yd. aggregate batcher, which is connected to a Toledo dial scale. Dual air-operated rotary valves under each cement bin compartment discharge direct into a Standley 30-cu. ft. cement batcher, which is also connected to a Toledo dial scale. Air jets in the bins insure a free flow of cement; 3,000 lb. can be weighed out accurately in 3 seconds.

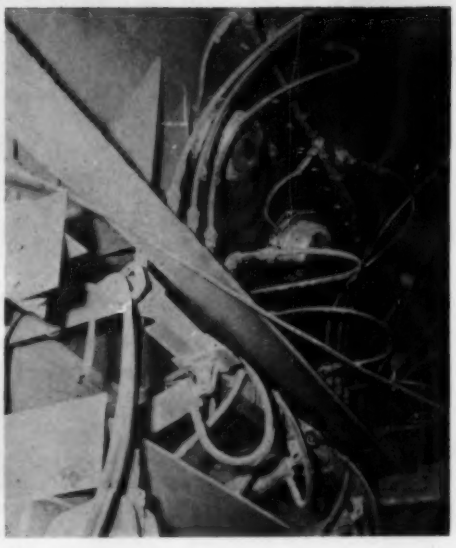
Water from the city mains goes to an 1,800-lb. storage tank over the water weighing batcher. The batcher has float valve control and a semi-automatic water valve. The water valve is opened manually, but when the Toledo dial scale returns from the setting to zero, a solenoid automatically closes the valve. Also on this floor are liquid dispensers for the Pozzolith and Protex admixtures. An Instant Moisture control meter and recorder is helpful in meeting various specifications.

Air-operated gates on the aggregate and cement batchers discharge these materials into the Ransome 4½-cu. yd. drum-type plant mixer. A hydraulic ram tilts the discharge chute to discharge its contents, a proceeding which the operator can see through a grating in the batching floor. The operator controls all batching and discharging operations by means of eight air controls on a panel. The air for all operations is supplied by a Bruner tank-mounted air compressor. All loads of concrete are also checked on the Toledo truck scale at the plant office.

The concrete mixes used are all designed by commercial laboratories, and test cylinders are sent to them periodically. Some job cylinders are also made. Master Builders' Pozzolith is used in all mixes the year 'round except where not desired by the customer; it is used in 85 to 90 percent of the concrete. Autolene







Above, right: The 100-hp. low-pressure automatic boiler which supplies steam to heat the mixing water and the aggregates in stockpiles and bins.

Left: The scales for the aggregate and cement batchers, with some of the pneumatic controls in the center.

Right: This view shows the cement bins with air agitation lines, the lower-level bin indicators, and the air-operated rotary valves to the batcher below.

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Lubricants Co. Protex is also used where air entrainment is desired. No extra charge is made for either of these additives.

Provisions made for heating can take care of the very coldest weather. The Cleaver-Brooks 100-hp. low-pressure (15 lb.) steam boiler is automatically fired by either gas or oil. It is hooked up with an 8-in. header and a baffle to equalize the pressure so the boiler cannot be primed. Running from the header is a 4-in. line to ½-in. live steam jets in the plant aggregate bins; 4-in. line running underground to hose and jets in the tunnel under the aggregate stockpiles; and a 2-in. line to the company-designed hot water heater, which uses copper flues instead of the usual coils. This heater can produce 400 g.p.m. of 160-180 deg. water. The cold water pipe to the water batcher is encased in electric coil heaters with a thermostat which automatically turns it on when the water temperature drops below 55 deg. F.

In moderately cold weather only the aggregate is heated and to a point where 70 deg. concrete can be produced without using hot water. When the temperature drops down to 20 deg. F. below zero or lower, hot water is also used, sometimes blended with the regular flow.

In the company's garage is a well-equipped shop where truck maintenance work is done, as well as overhauling and painting during the winter. There is also a modern Thermoflector block office which houses the accounting department, the scale and billing department, dispatcher's quarters, private conference room, and a basement for storage of records and a gas-fired heating system. A full view of the yard is possible from this office, and an Amplicall system is connected to all points.

Fred Bellamy is president of the Ready Mix Concrete Company. Kenneth H. Johnson is general manager, Walter Byers is plant superintendent, and Mrs. Lona Paris is office manager.

Concrete Pipe

(*From page* 254)

resistance to acid and alkali action will continue for years, this long-time research producing several significant conclusions in 1954.

The details of these and other current research projects and their meaning in terms of dollars of profit to the pipe manufacturer have been regularly publicized to the industry in the monthly house organ of the American Concrete Pipe Association, *Concrete Pipe News*. The membership of this association has grown from 175 to 190 members in 1954, and that of the affiliated association, the American Concrete Agriculture Pipe Association, from 18 members to 51 members in the year passed. Membership in A.C.P.A. now embraces representation in all of the Canadian provinces, and its president, A. W. G. Clark, of the B. C. Concrete Company, Ltd., Vancouver, B.C., being a Canadian further indicates that the association's activities are truly becoming all-American. Increasingly over the past year it has been recognized that the smaller, outlying pipe producers are most in need of promotional aid in combating local competitive activity. A larger proportion of the A.C.P.A. promotional effort has accordingly been channelled into such fields over the past year.

Several important trends mentioned in last year's survey have continued into 1954. The use of rubber coupling joints has almost become universal in sewer and culvert work. Larger pipe sizes continue to be made by an increasing percentage of producers. A greater emphasis than ever before has been made on the quality of concrete produced, aimed to meet the newer specifications authorized by governmental and other directing bodies. The new reinforcing cage design for pipe of larger diameters, involving a hanger principle, to better resist external loading stresses had several improvements incorporated in it during the year. The application of this principle of tieing or suspending the outer ring of reinforcing to the inner ring has been limited because of the comparative cost involved. The use of fly ash, or the additive, has practically doubled among concerns now making use of this additive for more workable, stronger and more durable concrete, used more in machine-made concrete pipe and especially by producers using the packer-head type of manufacture. The range of fly ash added to the mix varies from 6 to 20 percent by weight of the cement.

Some changes in the A.S.T.M. specifications for concrete pipe have been suggested in 1954. Tongue and groove non-reinforced concrete sewer pipe having 1¾-in. walls, and also extra-strength, non-reinforced concrete sewer pipe will be included in these specifications in the future. Cores may also be cut out of the walls of concrete pipe, to test the compressive strength of the specimen pipe, rather than using the 3-edge bearing test, if desired. In large diameter pipe the destruction of the specimen pipe is an appreciable item of cost of testing. The use of hard-rubber strips or sand-filled high-pressure hose as bearings in 3-edge bearing tests has also been permitted.

According to representative replies received from concrete pipe producers, there was no shortage of cement experienced by these firms during the year. The average pipe manufacturer usually contracts for cement over a long period of time, and because of the stable condition of the industry and most of its members, these contracts enjoy a high priority with the cement manufacturers. Drainage pipe accounted for about 12 percent of the total tonnage of pipe in the country in 1954, farm drainage requirements taking the majority of this tonnage. Other uses for this type of pipe are steadily growing and it is expected that these fields will raise the overall percentage in the future. Considerable progress was made during the year in the problem of the multiplicity of sizes and types of reinforcing used by the industry. In this endeavor to reduce the number of wire mesh areas required to be stocked by the manufacturers, it is expected that a standardization of the present some 300 styles and sizes will be effected shortly.

Hardly any of the producers interviewed as to the prospects for 1955 would specifically venture a guess as to the degree of change which might be expected in the future. The industry as a whole is so closely aligned with the construction industry that the variations in the general volume of construction demand dictate the volume of production and shipment of concrete pipe in most areas. However, the industry has its house in order. Never before have plants been found in such excellent shape equipment-wise. Public acceptance and approval by governmental agencies is at a high level, and reasonable specifications by the latter, as previously pointed out, must result in a more equitable use of concrete pipe over competitive forms. Plant consolidations will continue to effect better efficiency, where these will inject new blood into an ailing unit. Stability is an industry watchword which has been developed over the last 20 years of its growth and which must be zealously guarded by its members in the uncertain future ahead.

Southeast Regional N.C.M.A. Meeting
Draws Record Attendance at St. Petersburg

By ROY L. PECK

St. Petersburg's Sereno Hotel, headquarters of the recent Southeastern regional meeting of N.C.M.A.

another ON THE SPOT report

THE 11th annual meeting of the Southeastern group of the National Concrete Masonry Association held at the Sereno Hotel, St. Petersburg, Fla., on November 22 to 24, 1954, drew record attendance, totalling over 300, including block makers, their wives and families, material producers, and others interested in the industry. The three-day event provided a schedule of equal time allotted to talks and discussion in the mornings and to outdoor pursuits in the afternoons. This seasonally-appropriate innovation proved educational to many who took the bus to ride over the newly-opened "Sunshine Skyway" bridge spanning Tampa Bay, the longest overwater roadway in the world. Others enjoyed participating in the barbecue on the beach at the Tides Hotel overlooking the Gulf of Mexico.

There were many highlights in the varied program presented at each of the morning sessions. Subjects included current and future business conditions in various sections of the Southeast, masonry mortars, use of high-early-strength cement in block making, engineering developments in the industry, architectural treatment of concrete masonry walls, and reports to the members on precast concrete in Europe and on the International Concrete Congress held at Brussels, Belgium, last summer. Other speakers decribed present and future Florida developments and presented factual cost accounting practice for the block industry. The meeting closed with a stimulating talk on modern sales integrity.

George W. Katterjohn, president of Katterjohn Concrete Products Co., Paducah, Ky., and president of the Southeastern Concrete Masonry Association, presided at the first session. After the invocation by Dr. Frank P. Anderson of the First Presbyterian Church, and a sincere welcome to the visitors by William F. Davenport, St. Petersburg Chamber of Commerce, the meeting heard the report of the secretary-treasurer, William R. Ireland, Atlanta Aggregate Co., Atlanta, Ga. He presented figures on receipts and expenditures for the last three years, the period in which the Southeastern group has been a regional association within the framework of the national association. No dues are collected from members, he stated, all expenses being met by the registration fee charged at the annual meetings. Mr. Ireland described the growth of the regional group in its 11 years of existence.

Mr. Katterjohn then called upon various members in the audience to report on current and future business conditions in their respective areas. Sam M. Bailey, Jackson Stone Co., Jackson, Miss., reported that political influence largely dictated busi-

Some old-timers reminisce. Horace Bush (Multiplex Concrete Co., East Orange, N.J.), Sam Paturzo (V. Paturzo Bro. & Son, Baltimore, Md.), M. E. (Doc.) Rinker (Rinker Materials Corp., West Palm Beach, Fla.), and E. W. Dienhart (executive secretary, N.C.M.A., Chicago, Ill.).

Block makers and cement men get together. We recognize Bartlett, Paturzo, Oswalt, Hyde, Reed, and Mitchell in this group.

ness conditions in his state and that active "leg work" on the part of concrete block producers was necessary to insure consideration of the material in future construction.

John E. Kelley, Smith Concrete Products, Inc., Kinston, N. C., stated that block business was off 20 percent in the first eight months of 1954, but that the damage done to buildings by hurricane Hazel would require 3 years of reconstruction work.

Fred C. Dent, general manager of the Southern Concrete Masonry Association, New Orleans, La., admitted that business was not "booming", but that there was plenty of work on architects' boards. He cited instances where talks to architects and contractors by prominent operators in other areas had produced good results. He claimed that a loan differential unfavorable to concrete masonry use is often found in FHA financed projects.

Forrest Ladd, John A. Denies Sons Company, Memphis, Tenn., reported that conditions there did not warrant any complaint, being as good as in the last 3 years. He pointed out that meetings with influential groups paid dividends in getting lightweight concrete masonry specified in the large school programs, but warned that competitive materials were again entering the picture with lower prices.

R. C. (Dick) Page, Page-Groves Company, Lexington, Ky., stated that business was off in the eastern section of that state, better in the central portion, and very bad in the western end. The big government programs in the state were almost finished, but would still require tremendous quantities of concrete units for housing projects.

James M. Maples, Richmond Concrete Products Company, Augusta, Ga., president of the Georgia Concrete Masonry Association, praised the promotion afforded by the Portland Cement Association in obtaining concrete masonry specifications in state work and in a large school program coming up. Despite increasing brick competition, he feels that co-operation among agencies will produce a good volume in 1955.

W. D. Gillis, Gillis Block and Supply Company, Ft. Lauderdale, Fla., declared that a decline of 20 percent in business in the first five months of 1954 had come to an end; that he felt 1955 would see an increase of around 10 percent. His competition is severe, but "clean". He reported that construction in Fort Lauderdale County for 1954 would exceed $30,000,000.

Thor Germundsson, manager, Structural and Railways Bureau, P.C.A., Chicago, Ill., reported on precast concrete in Europe.

H. J. McDargh, southeastern regional manager of the Portland Cement Association, Atlanta, Ga., was optimistic concerning concrete business in his area for the next five or ten years. He said that his 30 years of service with the association has proved that the secret of success in the block business is to learn how to sell the product, rather than worry about how to make it.

C. E. Wuerpel, technical director of Marquette Cement Manufacturing Company, Chicago, Ill., presented a critique of current specifications pertinent to the subject of his paper, *Masonry Mortars*. He pointed out specific portions of A.S.T.M. Specification C 270-54 T which are especially important in preparing or using masonry mortars. He stressed the function of masonry mortar to retain water as probably its most important attribute. He stated that compressive strength is not always a good gauge of the excellence of a masonry mortar, emphasizing that it must "hold together" as well as "hold apart" the units of the wall. He pointed out that type N hydrated lime mortar (A.S.T.M. Desig. C 207-49) should always be used for masonry, as it has a higher water-retention value than type S mortar. In this respect, he said that an equal mix of clinker and limestone, ground with an air-entraining admix to get plasticity, will retain 90 percent of the water. He called attention to the importance of blending and bonding and showed slides illustrating what could happen to masonry mortar if materials were unsound or the workmanship deficient.

S. H. Westby, P.C.A., Chicago, Ill., spoke on the architectural treatment of walls using concrete masonry.

In a panel discussion on the merits of using high-early-strength cement in concrete blocks, W. D. Gillis, the first member of the panel, suggested that any such use be preceded by experiments with the materials in use at the plant. In his area, for example, the trade wanted a coarse texture in the block. His materials—ojus rock, screenings and sand—have a high lime content. Using an equal proportions of fine and coarse aggregates, his company replaced 75 percent of the previous cement content of a 4-bag mix in a 50-cu. ft. mixer with high-early-strength cement, getting a yield of 33½ blocks per sack of cement. This use of high-early-strength cement increased the strength of the units from 850 to 1,150 p.s.i. in 10 days of air curing. Even with the 93 cents-per-barrel differential in cost of high-early-strength cement over standard portland cement, a saving of 0.3 cents per unit was affected. Another favorable factor encountered in using high-early-strength cement in their present method of no curing—the units being placed under cover for 12 hours and delivered in 7 days—was that breakage was considerably reduced.

P. C. Smith, the Rinker Companies, West Palm Beach, Fla., revealed that his company had begun using high-early-strength cement from necessity, to remedy high breakage of units made without steam curing. He felt that this use was about the cheapest way to get 1,000-p.s.i. blocks. Using high-early-strength cement for 75 percent of the previous amount of standard portland cement used, they increased th 24-hour strength from 450 to 750 p.s.i. and could handle the units much earlier.

On this subject, F. Paul Anderson, Maule Industries, Inc., Miami Beach, Fla., confirmed the findings of the preceding speaker. His company found, he said, that the cement con-

tent could be readily reduced by 25 percent by using high-early-strength cement, while the strength increased and the yield was increased to 35 or 36 units per sack of cement. He also stressed the importance of tests with the owner's materials preceding any change in methods, and urged that a close control be maintained on moisture content in the mix. He said that with steam curing the same results could be obtained, but in a shorter period of time.

In the last paper of Monday's session, R. E. Copeland, director of engineering, N.C.M.A., Chicago, Ill., presented *Engineering Developments in the Manufacture and Use of Concrete Block*. He referred to the annotated bibliography on high-pressure-steam curing of concrete, recently distributed by the N.C.M.A., and prepared at a cost of $6,000, as the best report to read on this subject. Conclusions reached from his study of high-pressure-steam curing in concrete block manufacture include the following: reducing shrinkage by 50 percent, obtaining 28-day strength in 12 to 14 hours, provided that fine siliceous materials are added; reducing efflorescence; and preventing "popping" (to a large extent) in case unsound aggregates have been used. Another publication of data on high-pressure-steam curing will be distributed by June 1, 1955. This study is being prepared by a firm of New York engineers at a cost of $7,000, contributed by 55 members of the N.C.M.A. who are now autoclaving their units.

In relating the growth of this method of curing, Mr. Copeland stated that there were no producers who used high-pressure-steam systems in 1945, and there were but 2 or 3 such installations between 1945 and 1952. He cited as an example of far-sighted planning, an installation on the West Coast where blocks are steam-cured in cube form, to increase the kiln capacities, and indicated that this would probably be as efficient as curing blocks on pallets. He mentioned the recently-issued *American Standard Building Code Requirements* as a most authoritative code.

Mr. Copeland pointed out that competitive interests are working harder than ever before, citing as evidence of this tendency that the lumber industry now has eight men working on various code meetings held throughout the country, whereas the N.C.M.A. can devote only 1½ months yearly to this type of promotion. He warned his audience that block manufacturers must pay closer attention to eliminating the use of

Gilbert E. Olson (Builders Equipment Co., Phoenix, Ariz.) and Bengt Lundgren (Siporex, Stockholm, Sweden). A partner in the largest block operation in the United States and his world-traveler friend discuss new developments.

unsound aggregates, as aggregates constitute 90 percent of the volume of the unit. That defects in concrete masonry are being seriously considered by national agencies is evidenced by the new A.S.T.M. specification on lightweight aggregates, which contains tests for and preventive practice in staining, popping, and shrinkage. He cited the case of an armory building in a large Midwest city, built by the Corps of Engineers, which contained over 200 "pops" of unsound aggregates in its concrete masonry walls. Over the course of the last few years he said he had personally checked 115 buildings of concrete block which had bad wall cracks.

The speaker mentioned that the Bureau of Standards had compiled *Requirements for Concrete Masonry Construction* for the Corps of Engineers, since that agency considers it essential to prepare its own specifications in order to insure getting satisfactory units. The danger in such a procedure, he indicated, is that stricter specifications will increase costs and thus be bad competitively, whereas the real solution lies in the hands of the concrete producers.

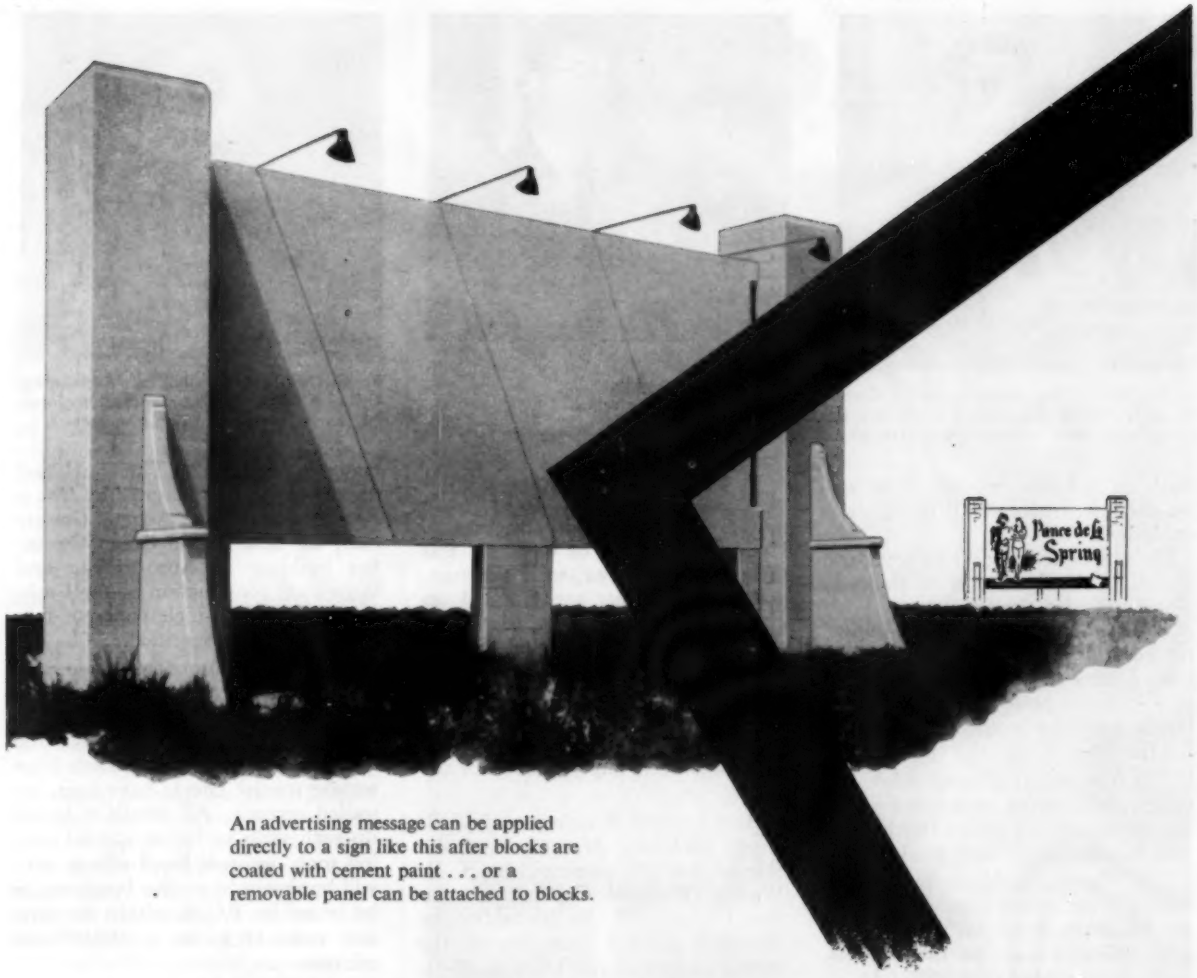
After reviewing some of the current research programs of N.C.M.A., Mr. Copeland addressed the question to his audience: "Are you getting your money's worth in N.C.M.A. membership?" He answered this by citing the cost of several of the association's publications, showing that if these had been prepared by outside engineering firms the costs would have been astronomically high.

He feels that the industry cannot afford to become complacent, especially in view of the activity on the part of competing interests. The Structural Clay Products Association, he said, is erecting a research laboratory in Skokie, Ill., at a cost of $250,000. This venture presages a renewed endeavor on the part of those promoting clay products to extend their market, now largely supplied by concrete masonry. The dues of members of that association are higher than those of N.C.M.A., and it appears to him that there will be no lessening of this competitive activity. Considering that much of the concrete masonry industry's growth has been in markets dominated in the past by clay tile and brick—which has, he reminded his audience, no problem in wall shrinkage to overcome—there will be no limit on the market for the block industry if members will shoulder their true responsibility.

Upon the resumption of the sessions on Tuesday morning, J. P. Taravella, executive vice-president and general manager, Coral Ridge, Inc., Ft. Lauderdale, Fla., drew an interesting picture of the Florida development, present and future, making use of official statistics to illustrate his statements. In the area of 4½ square miles of ocean frontage adjacent to Ft. Lauderdale, he said, over $60,000,000 was spent on construction last year. More hotels were built there in this period than in the entire United States. Most of this construction, as well as that of the 2,000 private homes in the $20,000-$40,000 class which were built in 1953, had walls of concrete masonry. In his own project, over $100,000,000 worth of vacant properties were sold in '53, much of which will be built on within the next ten years. He asked his audience to estimate this construction in terms of block sales.

Florida has suffered from a cement shortage in recent years. To partially alleviate this, the Lehigh Portland Cement Company has increased capacity at its cement plant built two years ago at Bunnell, Fla., making this a $22,000,000 investment. This plant is located on 11,000 acres of swamp and waste land west and northwest of Flagler Beach and takes its basic materials from three distinct ridges of coquina shell lying across the eight-mile length of property. According to Mr. Taravella, there are sufficient reserves of this shell material to maintain full operation of the plant for the next century. (For a detailed description of this plant see PIT AND QUARRY, July, 1953, pp. 98 to 113.)

Jerry Lynch, certified public accountant, cleveland, Ohio, whose firm had prepared a cost setup for Rinker Materials Corporation, West Palm Beach, Fla., gave a talk on cost accounting for the block industry.



An advertising message can be applied directly to a sign like this after blocks are coated with cement paint . . . or a removable panel can be attached to blocks.

an ill wind blows business your way!

Hurricanes and cyclones delight in blowing down ordinary outdoor signs, but not those constructed of concrete block. They are also the answer to brush fires, gunshots, rust, and peeling —something advertisers long have needed.

New uses like this for concrete masonry units are *your* answer to competition and the need for more profitable sales. Take a long look about you. Somewhere a new use for concrete block is waiting to be fitted into your profit picture.

And your production picture will be better if it includes Lehigh Cement. Remember, there's a Lehigh Cement to help you produce quality units with any manufacturing process.

LEHIGH
PORTLAND CEMENT COMPANY
Allentown, Pa.

LEHIGH PORTLAND CEMENT
LEHIGH EARLY STRENGTH CEMENT
LEHIGH AIR-ENTRAINING CEMENTS
LEHIGH MORTAR CEMENT

M. E. (Doc) Rinker, Rinker Materials Corp., W. Palm Beach, Fla., sold his listeners on co-operation and national association work.

C. E. Wuerpel, technical director, Marquette Cement Mfg. Co., Chicago, Ill., spoke on masonry mortars.

R. E. Copeland, director of engineering, N.C.M.A., Chicago, Ill., discussed engineering developments in block manufacture.

Such an industry, he said, does not require an intricately detailed cost analysis.

Only production costs were included in the five forms he showed. These included the following:

(1) The daily batch report, which records the mix (or mixes) for the day of cement, the various amounts of aggregates used, the time of each batch, and the number of batches for the day.

(2) The report of block cubed, on which the foreman reports the quantity of good block cubed for the day and the number of culls produced.

(3) The daily block production report, which gives a quick check of the efficiency of the day's production and indicates how the rate of production is keeping pace with sales.

(4) The summary of block production, a report made for the convenience of the accounting department in accumulating the daily block production, in accordance with size and type and the number of batches required for each.

(5) A monthly block plant operations report which records the total types and sizes produced for the month from the totals on Form 4. Under a summary of Costs on this form the total labor, total expenses, and material costs are summed up and converted into cost per 8-in. equivalent. All costs based directly on time, such as rent, etc., are eliminated in the production cost summary. The speaker said that the set of forms and an explanation of them are available to any producer for the asking.

Architectural Treatment of Walls Using Concrete Masonry was the title of the talk presented by S. H. Westby, Portland Cement Association, Chicago, Ill. In this address he described several examples of the recent use of concrete block in effecting a modern architectural treatment of walls. He explained that the term "concrete block" includes all types of units. The first action a producer must take in having his product specified and used in any job is to convince the architect of the beauty attainable in this type of unit.

Mr. Westby showed a number of colored slides depicting several noteworthy jobs for which concrete masonry was chosen. These included the display room sponsored by *House Beautiful* at the Los Angeles County Fair, the new Barber-Green Co. office building at Aurora, Ill., and large-scale construction of the Catholic church in which concrete masonry units were specified.

The speaker urged all those who are interested in promoting such units use to bring their prospective groups to Chicago for a tour through the P.C.A. laboratory where panels illustrating special effects have been installed recently. All details of laying up such walls including special scoring tools, unusual bond effects, etc., will be shown in a color brochure, to be issued by P.C.A. within the next few months, in a 100,000-run quantity.

After lunch on Tuesday, the business meeting was recessed for the day, and practically all those present took advantage of the bus ride over the newly opened "Sunshine Skyway" bridge crossing Tampa Bay. This $22,000,000, 15-mile project in-

Mr. and Mrs. Jay C. Ehle, vice-president, Cleveland Builders Supply Co., Cleveland, Ohio, celebrated "Janet's 21st birthday" at the banquet.

A merry group at the annual banquet: Horace Bush, E. W. Dienhart, Miss Betty Ermel, Chicago, Ill., and Mr. and Mrs. W. A. Neff, Danville, Ill.

cludes 3 miles of bridge segments which are believed to constitute the longest prestressed concrete structures in the world. In detail, the structures incorporate precast, prestressed concrete trestle spans supported by precast concrete pile bents. These prestressed concrete beams were precast in the contractor's yard on the mainland and floated on barges to the bridge site, where they were erected in much the same manner as steel beams. This method of construction eliminated in large part the concreting operations which otherwise would have been carried on out in the bay, subject to the hazards of varying weather conditions, hurricanes, etc. A detailed description of the prestressed portions of the project was contained in CONCRETE MANUFACTURER, August, 1953 issue, pp. 163-168.

On Wednesday morning the first speaker was Thor Germundsson, manager of the structural and railways bureau of the Portland Cement Association, Chicago, Ill. His report on *Precast Concrete in Europe* presented a visual account of the speaker's study trip to Europe in April and May, 1954, when he visited England, Denmark, Norway, Sweden, Holland, France, and Germany to survey the present status of precast concrete, with particular reference to structural uses. He illustrated his talk with an interesting series of color slides showing precast concrete procedures in Europe and discussed the factors which have influenced them. These slides were followed by a film which showed scenes of action in the jobs visited.

Operators of many products plants in Europe are interested in structural precasting, according to the speaker, as they have suitable facilities, as well as departments organized for sales, transport, and erection. Factory production, compared with on-the-site precasting, tends to be more economical if forms or molds are already available. Furthermore, the availability, wage scales, skill, and efficiency of labor at different points influence the choice between site and factory precasting. In the opinion of one contractor queried by Mr. Germundsson, labor problems at building sites rated highest among his reasons for preferring precasting in plants.

Probably more precasting in factories occurred in Holland than elsewhere, Mr. Germundsson felt. He also cited an instance in which a large industrial building near Copenhagen started with site production, but subsequently changed to factory

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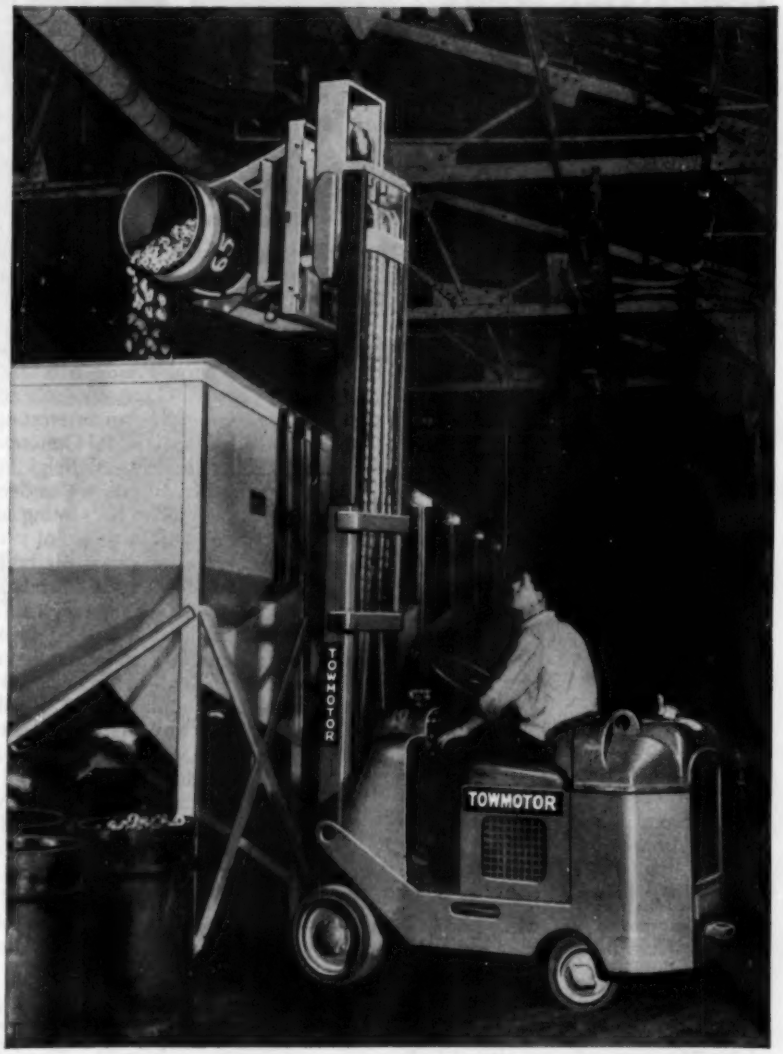


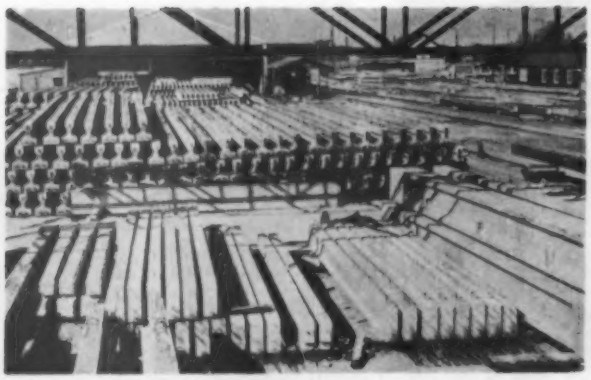
300% PRODUCTION INCREASE

. . . Overall Handling Costs Cut 60%

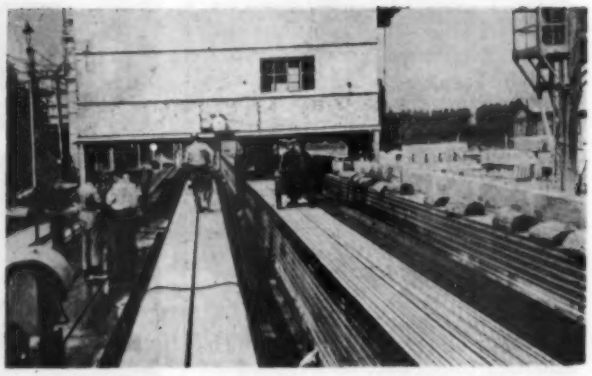
Job-Planned Towmotors now pour finished parts into hoppers using a Revolving Barrel Grab. Parts feed down to a weighing conveyor and are bagged mechanically for shipment. Manual filling was eliminated and output per man increased 300%. Overall, Towmotor cut handling costs 60%.

Towmotor equipment does wonders in every plant where handling is a problem. For more information write for Job Studies covering your industry, your competition. TOWMOTOR CORPORATION, Div. 1301, 1226 East 152nd Street, Cleveland 10, Ohio.

FOR FAST ACTION—See a Material Handling Specialist—your nearby Towmotor Representative. His factory training will show you the quickest way to attain maximum handling efficiency at minimum cost.



A small precasting plant in Holland. All structural members shown are made to order during the winter for spring shipment. These are made in the plant (background) and moved by overhead crane to trucks or barges.



A German precasting plant making hollow-core floor tile almost continuously in a 900-ft. long yard. Slab is cast, wire reinforcing is pretensioned, and the slab is cut to desired lengths later. Casting is done on a previously cast tier of slabs to a depth of 12 tiers.

precasting. Practically all jobs there are made to order, many manufactured during the winter in the plants for shipment in the spring. Most wall panels used were made in plants, where large, vibrated tables could be set up conveniently, to produce a cleaner surface than if the panels were job-made. Prestressing by the pretensioning method was usually done in a factory, he reported.

Another conclusion Mr. Germundsson reached was that throughout Europe the relatively lower labor rates resulted in a greater employment of labor for all work, with the minimum of equipment. The shortage of modern construction equipment abroad is still pronounced, but the situation in this respect is bettering in those areas where trade-balancing has been effected in some degree.

Mr. Germundsson noted that typical wall construction in Sweden has an insulation layer on the outside, consisting of precast cellular lightweight concrete, such as Siporex slabs. The supporting structural walls are on the inside of the building, and the outside walls are usually stuccoed.

Closely tying in with some points in Mr. Germundsson's talk was the address of the following speaker, Gus Smith Jr., General Ready Mix and Concrete Block Company, Clearwater, Fla., who gave an interesting report on the International Concrete Congress, held in Brussels, Belgium, last summer. Mr. Smith, we understand, had attended this meeting at his own expense with a group of students observing European methods of concreting. He said that the language situation at the congress proved not as difficult as had been anticipated, as all speeches were translated into English, French, German, and Dutch and piped to all listeners simultaneously *via* earphones.

Lectures at the congress mainly dealt with specifications, cellular concrete, shrinkage problems, and their causes and solutions. Shrinkage of concrete was considered a common and a serious phenomenon, depending upon the nature and form of the aggregates, the cement, the quantity of water, and the compounds added to the mix to control the setting time.

Mr. Smith said that the European concept as regards water is to eliminate the water before the mix hardens, and there will be no shrinkage. European operators feel that high-pressure-steam curing is the only way to cure concrete masonry units. There was considerable discussion of the Siporex method of producing lightweight concrete. This is made from cement, sand, and water, plus finely pulverized aluminum powder and other additives which cause fermentation and air bubbles to form in the slurry mix. These spherical cells are not interconnected but evenly distributed through the section and separated by very thin, but strong walls. Some of the advantages claimed are low absorption of water; high insulation value, frost resistance, and strength; very low shrinkage from saturated to dry condition; chemical inertness, and good color. It was said that over 100,000,000 sq. ft. of Siporex slabs have been in-

Air view of the $22,000,000 "Sunshine Skyway" spanning Tampa Bay, Fla. A portion of the 15-mile crossing is the longest precast, prestressed structure in the world.

This New Block Plant

---a tribute to

OSWALT SERVICE

Built as a result of Oswalt Service to the industry, this new property represents a significant achievement in block plant design. It reflects the knowledge and experience accumulated in more than 30 years of day-to-day operations.

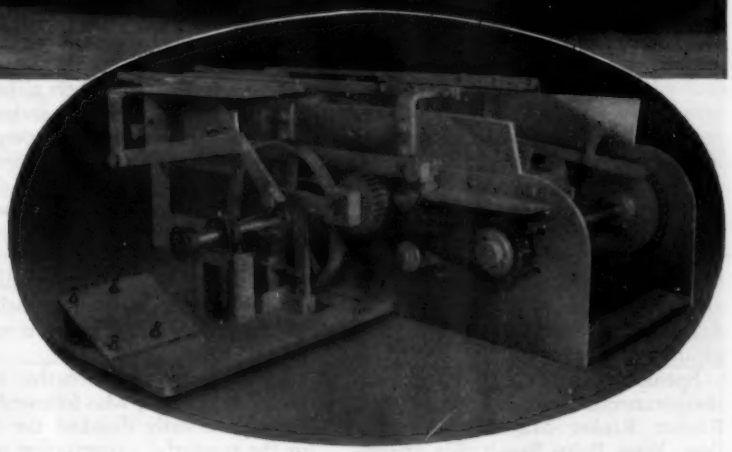
This plant is equipped and mechanized for the most advanced methods of block making. Here, the modern ideas in material handling and production, as developed by Oswalt engineers, are demonstrated and proved in actual practice.

• • • •

The steady contribution of new developments to the block making industry by Oswalt Service is the result of teamwork and consolidated thinking.

It represents the combined results of our own engineering research and experience plus the help and suggestions of our many subscribers to Oswalt Service.

When you become a subscriber to Oswalt Service, you will profit from the exchange of ideas and the progress reports that keep you informed of the latest methods and improvements.



OSWALT Heavy-Duty SHOCK-FREE BLOCK EJECTOR and FRONT-END PALLET FEEDER

THIS combination unit is one of the numerous contributions to the block making industry by Oswalt Service.

It is designed for shock-free handling of green blocks to eliminate cracking and reduce culls to a minimum. The ejector mechanism removes the block as gently as if done by human hands. It starts slowly, accelerates to maximum, then slows to a stop . . . no jerk, jarring or shock.

This machine is an outstanding design for smoothness in operation as well as efficiency and durability. The pallet feeder at front end saves time and labor, and helps speed production.

OSWALT Complete Service to Vibrapac operators includes:

1. Shock-Free Block Ejector and Front-End Pallet Feeder
2. New Simplified Height and Density Control
3. Improved Vibration and Machine Changes for speed-up.

The equipment of these services is installed under supervision of Oswalt service men. Operation is tested and proven on the job to insure proper installation and guaranteed results.

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stalled in Europe over the last six years.

Gilbert E. Olson, Builders Equipment Company, Phoenix, Ariz., also spoke briefly on his visit to the Belgian Concrete Congress. As vice-president of the company operating probably the largest concrete masonry unit plant in the world, and the next president of the 1955 concrete congress, to be held in Germany, Mr. Olson is in a preeminent position as an ambassador of the American concrete industry. He said that most Europeans he met tended to keep their trade secrets to themselves, and declared he had enjoyed showing these people the American system of disclosing such information for the eventual benefit of the whole industry. He remarked upon the heavy concentrations of block making plants in certain areas, citing the case where within a 10-mile square area there were 770 block plants, nearly all small operations. Pumice is plentiful at the surface in that region, and whole families go to work digging it out and making block of it. He promised he would show a film of this practice at the Cleveland meeting of N.C.M.A. in January, at which he expects to consolidate in a report all the information gleaned in Europe.

Speaking vigorously, in an extemporaneous vein, M. E. (Doc) Rinker, Rinker Materials Corporation, West Palm Beach, Fla., president of the N.C.M.A., said that meetings such as this one portray to him the great need for closer co-operation and joint action on the part of all concrete block producers. He noted the constant and serious discussions which had characterized this meeting, when two or more block makers got together. He declared that producers must protect and improve the business all are in against encroachment by competitive interests. He cited several instances in which prominent architects specified clay tile for buildings in Florida, and expressed regret that this had been allowed to occur. He traced the growth of the N.C.M.A. and praised the engineering and promotional staffs for what they accomplish with relatively small budgets, comparing their work with the increasing activity of the lumber, clay products, and steel lobbies. He appealed to all—members and non-members alike—to back the association in its endeavors to better the quality of concrete products. He compared the dues cost of membership with church donations, with the dues of labor union members for their personal gains, with interest on plant investments, and with other normal expenditures in every-day living, and concluded that N.C.M.A. membership is an excellent bargain.

E. W. Dienhart, executive secretary of N.C.M.A., who followed Mr. Rinker, modestly thanked the latter for the masterful presentation of the association's aims and workings, adding that during Mr. Rinker's term of office the association had greatly expanded its scope of activities. He related how office space, employees, and budgets had correspondingly increased under this augmented program. He described his job as the correlation of all activities. He stated that practically all available space for the concrete exposition which is to be held in connection with the annual meeting of the N.C.M.A. in Cleveland had been sold. He said that this equipment show had become a substantial part of the revenue of the association, and urged that all attending the meeting show full co-operation with the firms exhibiting their products at that time.

The concluding address on the program, *It's Your Business,* was a face-to-face challenge to the audience by F. E. L. Whitesell, of Winter Park, Fla., who presented a critique of modern sales integrity.

An appreciated addenda to the scheduled talks was the film shown and described by Bengt Lundgren, Siporex Company, Stockholm, Sweden, who had flown to St. Petersburg for the meeting. Mr. Lundgren showed examples of the use of his product, a lightweight mixture of concrete, described previously in this article, in various structures of Europe. It was evident to all that there is a place for such a system in this country for making insulated and reinforced floor and roof slabs, blocks, and structural members.

Ready-Mixed Concrete

(*From page* 251)

centage prevalence of labor unionization in the various areas, and the higher increase in the scale of living costs in the East.

Lightweight Concrete The production of lightweight concrete, mostly for floor and roof fill, was of negligible content in general. Reports of considerable yardage (in percent of total volume of concrete) were furnished in a comparatively few instances, evidently by firms who have built up this type of business in their respective areas. This potential volume may represent an appreciable portion of a plant's output in the future, although it is felt that this type of construction is more rapidly being assimilated by insulative lightweight concrete in the form of pre-cast or prestressed panels rather than by poured concrete volumes.

Cement Supply Cement supply was reported to be sufficient by the firms answering our question in this regard in the questionnaire sent concrete products producers. The specific inquiry was not, however, included in addressing ready-mixed concrete producers. Many of the latter, in answering as to the effect of the increased highway budget, advised that cement supply did not appear to be a problem for 1955.

Recent Changes in Ownership Of Concrete Products Plants

Among the changes in ownership of concrete products plants and ready-mix operations are the following:

Kenneth A. Schultz Concrete Products, Minot, Kans., has been purchased by Clarence D. Johnson.

Muscogee Concrete Products, Topeka, Kans., has been sold to Camp Concrete Products Company.

Fred M. Stowell Concrete Company, Tulsa, Okla., has been acquired by E. F. Rice and O. E. Nidiffer, who will operate the business as the Tulsa Ready Mix Concrete Company.

Barker Gravel, Inc., Anderson, Ind., recently sold to a firm headed by F. E. Shouweiler, will be operated under the name of Anderson Ready Mix, Inc.

W. P. Wolfal has disposed of his ready-mixed concrete business to the Shelby Gravel Company of Shelbyville, Ind.

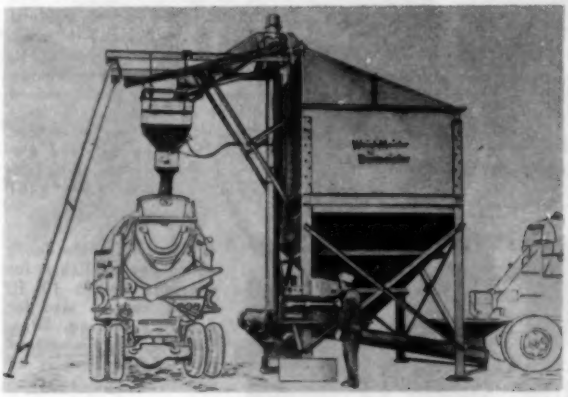
Wide Variety of Pipe Made At New Indiana Operation

Limited production of a wide variety of concrete pipe sizes has been started at the new automatic plant of the J. E. Evans Concrete Products Corporation at Shelbyville, Ind.

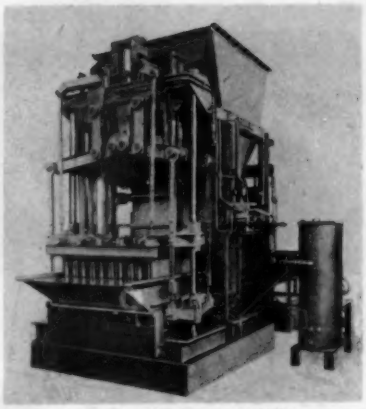
The firm is prepared to produce pipe ranging from 8 to 84 in. in diameter. Company officials stated that the plant has a capacity of $2,000,000 worth of pipe annually.

Archie Anderson of the Anderson Haulage Company, Columbus, Ohio, died on September 17. He was one of the members responsible for the organization of the Ohio Ready Mixed Concrete Association in 1938, and was a director for many years.

CM New Machinery and Supplies



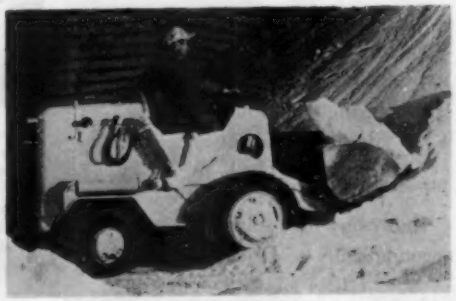
● A new batch lift design with a fast screw-action lift, low bin and automatic batcher that gives high capacity, great accuracy, and easy portability has been announced by L. Burmeister. Automatic electro-pneumatic push-button controls cut costs and make batching faster and more accurate than was heretofore possible. The new lift is designated the Weigh-Meister for its high precision and speed in batching cement. ←(101)

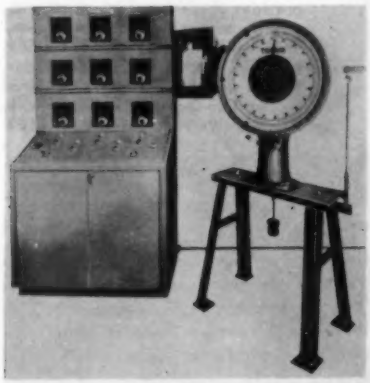


● The latest development of Schlosser engineers of Germany in their VS4A series distributed in the U.S. by M.B.I. Export & Import, Ltd., is the fully-automatic Block-machine having an 8-hr. production capacity of 18,000-8- x 8- 18-in. blocks. ↑(102)

● General Electric has added an entirely new 25-watt mobile combination transmitter-receiver to its line. The new two-way set, which operates in the 152-174 megacycle band, works from either a 6 or 12 volt battery, interchangeably. In case of crowding of operating channel width, provision has been made to easily convert the unit to split channel use. Because of its compact size, the unit may be mounted on the dashboard by the simple addition of direct controls on the radio itself. ↑(104)

● Offering twice as much carrying capacity and more than twice the lifting and digging capacities, the new Payloader HA, made by the Frank G. Hough Co., is an ideal small unit for feeding mixers, moving materials, etc. Other features include: 40 degrees of bucket tip-back with breakout action; 16-2/3% increase in bucket capacity; and the same width, height, and wheelbase. →(103)





● A new simplified, compact, and versatile electronic batching system is now available for such continuous process industries as concrete and hot-mix from the Scale Division of Thurman Machine Co. Providing more rapid weighing of all material for accurate batching, the new Thurma-tronic system is adaptable to either accumulative or consecutive weighing. Controls may be set to weigh one batch or for completely automatic continuous batching. ↑(105)

JANUARY, 1955

MORE INFORMATION PLEASE

THE CONCRETE MANUFACTURER
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CHICAGO 5, ILLINOIS

Please send more information on items described in editorial columns of this issue, as circled below.

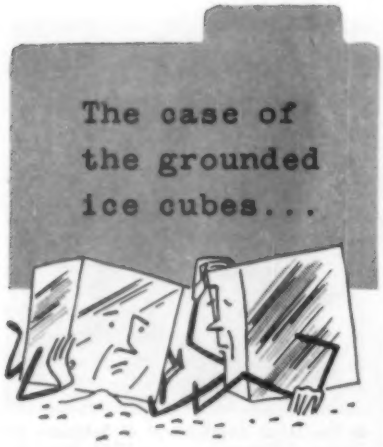
101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130
131	132	133	134	135					

Name_____ Title_____

Company_____

Address_____

City_____ Zone_____ State_____



The operations of a Buffalo ice-making plant came to a costly impasse. Ice cubes were grounded for want of some way to unclog their transporting devices. Hammering was slow and often damaging to the equipment.

There was a solution, however, that solved the problem economically and swiftly . . . a CLEVELAND vibrator.

Let us know about **your** *grounded material, or ask for our detailed literature. Engineering recommendations without cost or obligation.*

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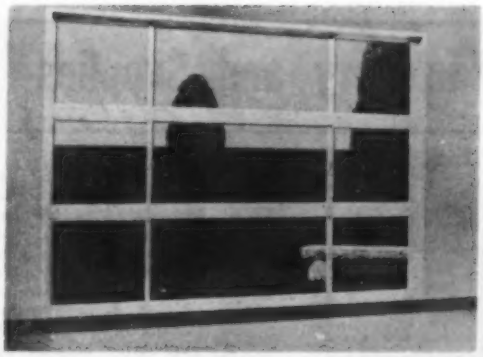
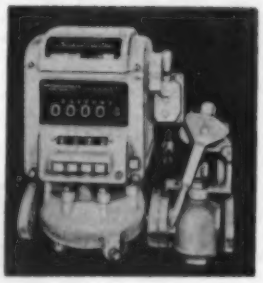


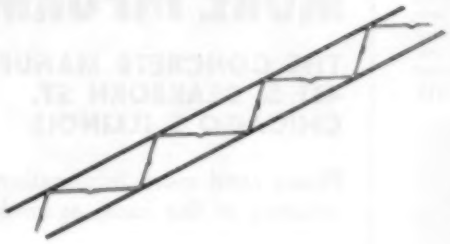
● Illustrated is a window wall made of 3 standard size 9020 Per-Fit aluminum slider windows. Any size desired can be made up by using combinations of standard size 500 series Per-Fit sliders that come in widths from 2- to 6-ft. or Per-Fit slider picture windows that are from 7- to 9-ft. wide. Both range in height from 2 ft. to 3 ft. 8 in. Now any window wall may be made from standard sizes kept in stock. Exterior trim is integral with the frame and beautiful matching extruded aluminum interior return and trim is available. ←(106)



● A built-in, explosion-proof electrical switch is actuated automatically when any desired quantity of liquid has passed through this new Neptune Auto-Switch meter. The switch can be used to turn pumps on or off, actuate solenoid valves, start agitators, or control other cycling operations. It is available either with or or without the mechanically coupled Auto-Stop valve, which also is actuated by the tripping mechanism in the register. ←(108)

● Candor flexible doors, which are available for openings up to 10 ft. square, can be used for concrete curing kilns. Concealed in the vertical tube of the door is an adjustable double action spring mechanism which returns the Candor to closed position. Easy enough to install yourself, they provide quick opening. ←(107)

● This newly improved Big Bully air hammer shown during cleaning operation on a fragile concrete mixer blade is excellent for star drilling, cleaning mixing trucks, and chipping waste concrete from mixing room floors. The 28 tools available to fit this 50-ounce, 6-in. tool make it one of the most versatile available. →(109)



● Dur-O-waL cavity wall reinforcing drip cross rods which serve as wall ties are made with high tensile steel rods. Dur-O-waL exceeds the general minimum codes of 3/16-in. tie for each 3 sq. ft. of wall and provides maximum anchorage with positive and uniform spacing of ties. They have improved deformed side rods and electric butt welds, Cedar Rapids Block Co. reports. All drip section Dur-O-waL is furnished with all steel side rods needed. ←(110)

● By using Clark-Ross fork trucks for rapid movement of heavy concrete pipe joints from manufacturing to yard storage facilities and shipping points, officials at the Sherman Concrete Pipe Co., Knoxville, Tenn., report that from 8 to 10 men have been released for more productive jobs in the plant. The firm produces pipes in sizes ranging from 10-in. to 84-in. in diameter and up to 96-in. in length. Handling these heavy joints is a job for 3 Clark-Ross fork trucks of 26,000-, 15,000-, and 10,000-lb. capacities. →(111)

NEW

WeighMeister

Screw-Action Batch Lift

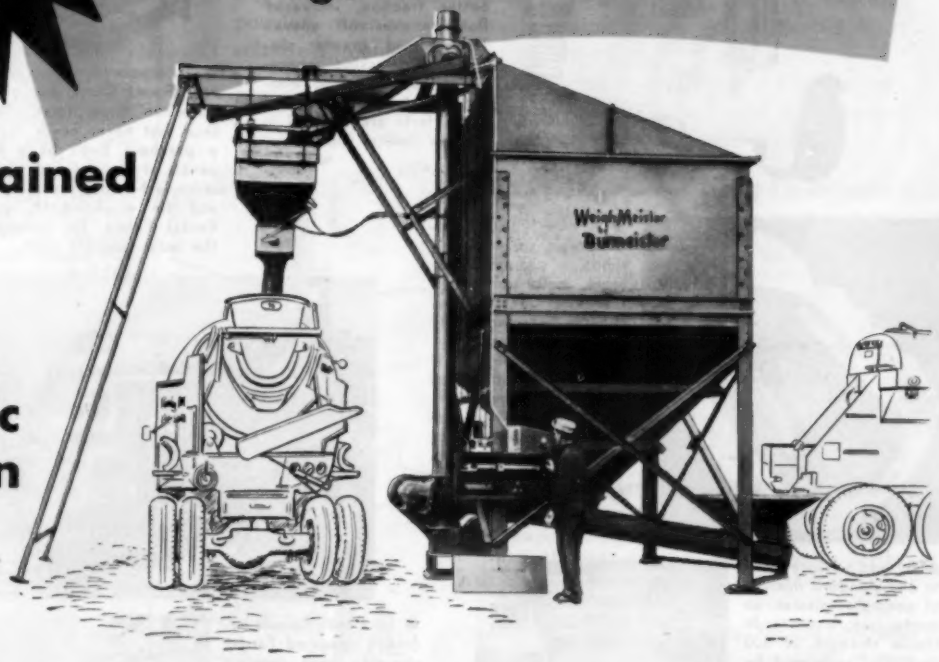
Self-Contained

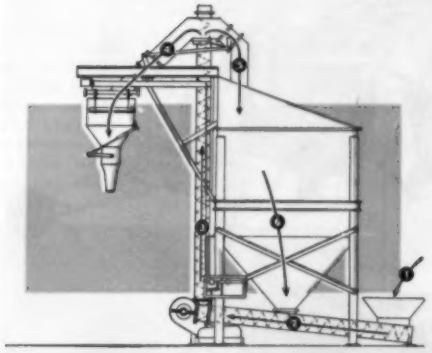
Portable

Accurate

Automatic Operation

Fast!





❶ Bulk cement is delivered at track site or from truck at ground level. ❷ Feeder screw delivers to WeighMeister's vertical screw. ❸ High-capacity vertical screw lifts cement to ❹ precision batcher, which dumps either automatically or at operator's control. ❺ When pre-set weight is reached, flow automatically shifts to storage bin. ❻ Between bulk deliveries, cement flows by gravity from storage bin to feeder screw. Controls can be set to stop feeder and vertical screws automatically, if desired, when weight is reached.

Delivery and batching are completely independent, go on simultaneously without interfering with each other. WeighMeister may be used without bin at track site for batching or transfer plant.

WeighMeister gets its capacity from the fast-working screw lift. The precision-fed batcher and automatic electro-pneumatic controls give it dependable accuracy for constantly uniform mixes. One man operates the WeighMeister by three push-buttons, with no manual levers to waste time and cause error. Low bin cuts height in half, saves on weight and initial cost. The WeighMeister is totally self-contained with its own compressor for the automatic controls and its own electric motor or gas engine. All air and electric lines are permanent; no connections to waste time in moving. Makes light, compact, integral unit easy to set on single truck. Needs no footings or ramps. Just set WeighMeister on any firm, level spot—have it running in a short time. See your distributor or write for details. L. Burmeister Co., 4531 W. Mitchell St., Milwaukee, Wis.

Burmeister

COMPLETE PLANTS FROM A SINGLE SOURCE

● A Towmotor fork lift truck equipped with 12 individual forks mounted on a special, extra-wide carriage speeds block handling, users claim. This new job-planned accessory makes a Towmotor LT-60 with dual-drive wheels and Side Shifter an efficient block handler. Since cubes of block handled are extremely large and heavy, dural-drive wheels provide better traction, increased flotation over soft, uneven terrain, and greater stability in stacking operations. Safe handling without pallets is assured because forks are inserted in bottom row of blocks. ←(112)

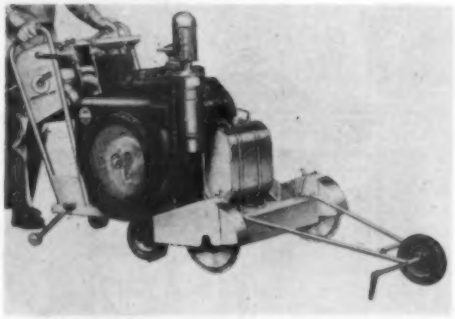
● To supplement their well-known Rental Form, Economy Forms Corp. has placed on the market a new "Lifetime" steel form. This new form, with a steel face that never needs replacing, is being offered on a purchase basis at a price competitive to wood panels or wood faced panels. They make use of the same fast-acting plate clamps, Aliner clamps, and pin and tie arrangement, as are used with Economy Rental Forms, for assembling and alining forms in the least possible time. ↑(113)

● A new type of control valve for handling solids in suspension, or other bulky materials, the Red Jacket valve can be operated either pneumatically or hydraulically for on-off service or as a control valve. The valve body is cast iron and the sleeve is pure gum rubber, butyl, or neoprene. The valve does not require a large external mechanical operator to close. ←(114)

● Bigger pay loads, greater digging depths, and faster operation spells more profit when using Little Giant's new goose-neck back hoe attachment. Standard equipment for the 1/3, 3/8, and 1/2 cu. yd. machines, it gives superior digging and dumping action. Self-aligning roller bearing construction on all shafts are lubricated and sealed for life. ←(115)

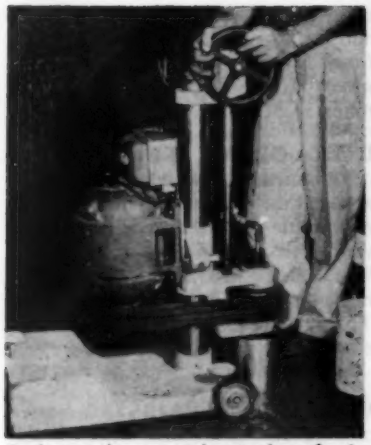
● By adding Sure-Bond to any standard mixture of concrete, plaster, or mortar, an increase in tensile strength of 400 to 500% is claimed by its manufacturers. Sure-Bond is a plastic synthetic resin in a specially formulated emulsion form which increases the abrasion, corrosion, and impact resistances of the mixture many times over. →(116)

● Four entirely new hydraulic operated Target concrete saws ranging in power from 15- to 36-hp. are available with manual start, or electric starter systems. The blade is lowered into cut by pump-action which eliminates any possibility of the blade being dropped suddenly. With its 3-wheel suspension, the Target saw is highly maneuverable. →(117)

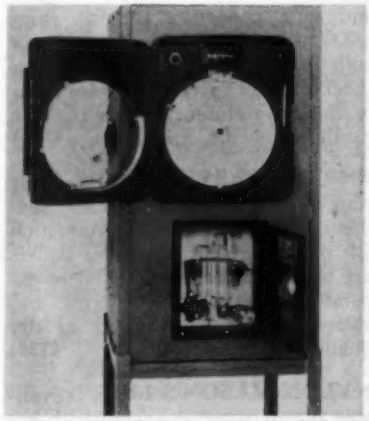


● The new low-cost, heavy-duty, table type vibrating table made by Concrete Mold & Engineering Co. has all the features of their standard 8 ft. conveyor-type vibrator to give many years of continuous trouble-free service. Table top dimensions are 36- x 18-in., and 16- to 26-in. high. ↑(118)

● By using a gravel scoop on a fork truck, Mid-West Block Co. has been able to handle thousands of pounds of sand and gravel and speed up block production. The concern uses a 2000-lb. capacity gas-driven Clark fork truck for all handling needs in production. Raw materials for the block machines are handled with the gravel scoop, while forks replace the scoop for handling finished blocks to and from the storage racks and stock pile. ←(119)



● A smooth, accurately-cut plug of reinforced concrete is removed with the aid of "Mechanized Mole" made by Molco Drilling Machines, Inc., from a 12-in. slab after running time of less than 4 minutes. This light-weight, high-speed machine can drill to a depth of 18 in. and even deeper with an extension shaft. ▲(120)



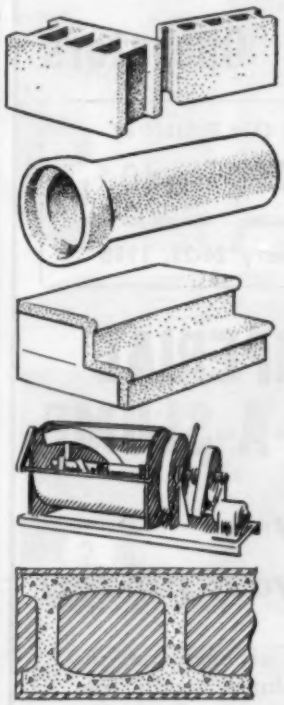
● This Arnold O. Beckman dissolved oxygen analyzer is a boon for those who are solving boiler corrosion by mechanical deaeration and chemical scavenging. It provides a continuous measurement of dissolved oxygen in boiler feedwater by using an ion exchange unit, an analyzer, and a modified recorder. ▲(121)

● A stationary guard ring on this Stow Roto-Trowel makes the machine much safer and also allows the operator to work right up to walls and other obstructions. Releasing the handle stops the trowel. ▲(122)

How Some Manufacturers Make *BETTER* Concrete Products at *LOWER* Cost, with *FLY ASH*

Fly Ash is a low-cost product. It is an extremely fine, wettable powder, mainly silica and alumina. Most of its particles are spherical in shape. It is a highly effective Pozzolan.

Many alert manufacturers, using a percentage of Fly Ash with the Portland cement, turn out a concrete of equal or improved qualities at a substantial saving in cost of materials.



Compressive Strength: Fly Ash Increases It

Many independent tests on concrete products made with a percentage of Fly Ash have shown equal or better 28-day compressive strengths as compared to those made with straight Portland cement. There is little or no reduction in 3-day strengths, especially where steam curing is used.

Sulfate Resistance: Fly Ash Improves It

Sulfate resistance is highly important in concrete sewer pipe. Tests on specimens of concrete containing a portion of Fly Ash showed greater resistance to the action of sulfate waters than did straight Portland cement concrete.

Finish and Texture: Fly Ash Makes Both Better

Comparisons show that concrete products made with mixes containing a percentage of Fly Ash have sharper edges and corners . . . smoother, more uniform surfaces . . . than products made with straight Portland cement.

Life of Machines and Moulds: Fly Ash Lengthens It

Fine, spherical particles of Fly Ash have a "ball bearing" action which increases flow and plasticity of the concrete and reduces abrasion. This means less wear on mixer blades, hoppers and moulds—longer life of your equipment.

Filling Moulds and Frames: Fly Ash Helps It

The greater plasticity of concrete containing Fly Ash reduces adhesion to pallets, and permits faster and more complete filling of moulds.

FLY ASH improves Compressive Strength, Texture, Finish, Sharpness of Edges and Corners, and Uniformity of Color of the Concrete.

FLY ASH increases "Green" Strength, Resistance of the Concrete to Penetration by Water, and Resistance to Action of Sulfuric Acid and Sulfates.

FLY ASH reduces Cost of Materials, Maintenance on Wearing Parts, Sticking to Pallets and Moulds, Cracking in Handling of the Concrete.

Write for Information or Technical Help

It costs nothing to get the facts on Fly Ash; it might mean a great deal in the success of your operation. Contact any of the following for specific information and technical data on use of their Fly Ash of proven performance, or stop in to see us at Booth No. 164, Concrete Industries Exposition in Cleveland.

G. & W. H. CORSON, INC.
Plymouth Meeting, Pennsylvania

DETROIT EDISON COMPANY
2000 Second Ave., Detroit 26, Mich.

CHICAGO FLY ASH COMPANY
228 N. La Salle St., Chicago 1, Ill.

New Literature

A FREE TRIAL of the many types of *Clipper* saws which are backed up by 20 years experience is offered. Made to fit every make and model masonry, concrete, or hand power saw, they come in abrasive, CBR, and diamond types. Consider the self-propelled Clipper concrete saw which is powered for heaviest duty and the masonry saw with Select-A-Notches which gives instant, positive height adjustment. **(123)**

BLOCK AND STAVE machines which put new profit in your concrete business through labor saving features are announced by the *OK Mfg. Co., Inc.* Their semi-automatic block machine is a vibrator and pressure-head unit that makes all sized blocks and has a capacity of 3 to 5 blocks per minute. **(124)**

PRE-CAST CONCRETE handling for use in bridges with the use of the RT-150 and YT-40 lift trucks of the *Hyster Co.* is covered in this field report. **(125)**

A MASONRY COAT which preserves texture, enhances beauty, retards moisture passage and mildew, resists acid, alkali, oil, and grease, and stops sweating of walls is the *Ideal* Masonry Coat. Application is speedy and easy by brush, spray, or roller. **(126)**

INTRA-OFFICE TELEPHONE communications speeded up by the application of a system designed by *Automatic Electric Sales Corp.* might very well be the answer for those "concealed" problems in your business operation and management. This booklet explains the advantages of a P-A-X private telephone system. **(127)**

CONCRETE REPAIRS are easier and more permanent when *Weld-Crete* is used to avoid costly, time-consuming chipping, drilling, acid-washing, roughening, and scarifying of concrete bases. **(128)**

LIFT TRUCKS powered by *Yale* gasoline, diesel, and LPG engines and with capacities ranging from 1,000 to 10,000 are described in this bulletin. A handy chart provides a check sheet of specifications for comparing the different models of Yale gasoline-powered equipment. **(129)**

AN ORDINARY BOILER can put your profits in a strait jacket, says this booklet, by limiting production all along the line. *Kewanee* boilers are built to meet the demand of expanding and fluctuating loads, and assure an adequate supply of dry quality steam. **(130)**

NYLON MASON'S LINE is available from *United Builders* which has strength nearly four times as great as ordinary cotton line of the same diameter. It provides a tighter line with less sag and less wind resistance. Long wearing qualities insure a minimum of lost time due to line breakage. **(131)**

TRANSFER BATCHES of any size from a dump truck to a truck mixer are handled by a Travel Batcher made by the *Southeast Ready-Mix Co.* Built-in scales on it allow batching from stock piles with any front-end loader; and with optional side bins added, a greater production of "volume yardage" is effected. **(132)**

CONCRETE POSTS with prestressed reinforcing and quick, easy fastening sell themselves when displayed in a prominent location. These Larsen "Lifetime" posts are easily made on equipment available from the *Concrete Post Form Co.* The mold is strong, lightweight, and durable because of its cold-rolled, sheet steel construction. **(133)**

Attention Central-Mix Operators

See Our Exhibit at
BOOTH 10
NCMA Exposition — Cleveland Auditorium
January 24-27, 1955

IMPERIAL TEL-A-SLUMP

To save time and money— improve the quality of your product

Highly successful in over five years of operation, the Imperial Tel-A-Slump indicates the slump of the concrete at any point during the mixing process—enables you to correct for moisture variation with no loss of time.

During convention time this year, check with a few of the producers, who are now using the Imperial Tel-A-Slump.

Concrete Corp. of Indiana, Indianapolis, Ind.
Central Concrete Co., St. Louis, Mo.
Guaranteed Concrete Company, St. Paul, Minn.
Winkworth Company, River Rouge, Mich.
Somers-Barr Company, Inc., Urbana, Ill.

IMPERIAL CONSTRUCTION EQUIPMENT COMPANY
Division of Imperial Flooring and Waterproofing Company
230 W. NORTH AVENUE NORTHLAKE CITY, ILLINOIS
TRUCK MIXERS • BLOCK UNLOADERS • PLANT CONTROLS

W. E. Dunn Mfg. Co. Buys Concrete Equipment Co., Champion, Korpak Builder

Through negotiations recently concluded, the W. E. Dunn, Manufacturing Company, Holland, Mich., has acquired control of the Concrete Equipment Company, also of Holland. This will terminate the activities of the Concrete Equipment Co., which is best known to the trade as sponsor of Champion drain tile machines and Korpak block machines.

Inasmuch as these machines have always been built in the Dunn plant, the change will not affect the interests of owners of Champion and Korpak equipment. The only significant point in the transaction is that W. E. Dunn Mfg. Co. will render direct service to machines already in the field, and will undertake the merchandising of the line from now on.

Booklet on Use of Permalite In Roof Decks Is Offered

Great Lakes Carbon Corporation's Perlite Division has issued a new handbook, *Permalite Concrete Roof Deck Specification Manual,* featuring lightweight insulating fireproof concrete.

This is believed to be the first working guide on this subject. Six basic types of roof structual forms are covered; drawings give construction details, and tables supply data on all types. The Permalite staff has been gathering and correlating the material, running tests and having the data checked by competent outside authority for the last 3½ years. Copies of this manual are available to architects and engineers through Permalite franchises, or through Great Lakes Carbon Corporation, Perlite Division, 612 So. Flower St.. Los Angeles 17, Calif.

J. H. Buchanan, president of Maule Industries, recently announced the completion of that concern's new plant at Homestead, Fla. The new plant has rock crushing and screening, block manufacturing, and ready-mix concrete batching departments. The 400-acre tract is said to contain enough rock reserves for 16 to 18 years.

The detonation of a charge of dynamite placed (apparently by an unknown person) in the gear mechanism of a concrete mixing tower at the Acme Concrete Corporation, Miami, Fla., caused an estimated $30,000 to $50,000 damage at the plant.

How THORITE *patches and* THOROSEAL *seals concrete structure of building and give it that new look!*

Abrasive Products Company
Braintree, Massachusetts

See Us at
Booths 172-173
AT THE N.C.M.A. SHOW

1 Before patching with Thorite, loose concrete is removed and rust cleaned from reinforcing rods.

2 Thorite is then applied, bringing patch to surrounding surface. THORITE will not shrink.

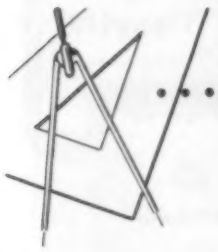
3 A coat of Thoroseal is then given the patched section and all exposed concrete of similar areas. This building has been restored to its original structural lines and protected from further deterioration.

THOROSEAL seals water out as it beautifies the masonry surface.

Get our pictorially-described literature in detail "HOW TO DO IT."

Standard Dry Wall Products, Inc.
NEW EAGLE, PENNSYLVANIA

● A showcase for its own products, the new one-story office of the Hollywood, Fla., branch plant of The Marietta Concrete Corporation is built entirely of the firm's building products. These products include interlocking concrete block, precast concrete roof beams, poured concrete and Marblox — a marble-faced concrete block.



ANOTHER OUTSTANDING INSTALLATION
DESIGNED and FABRICATED by

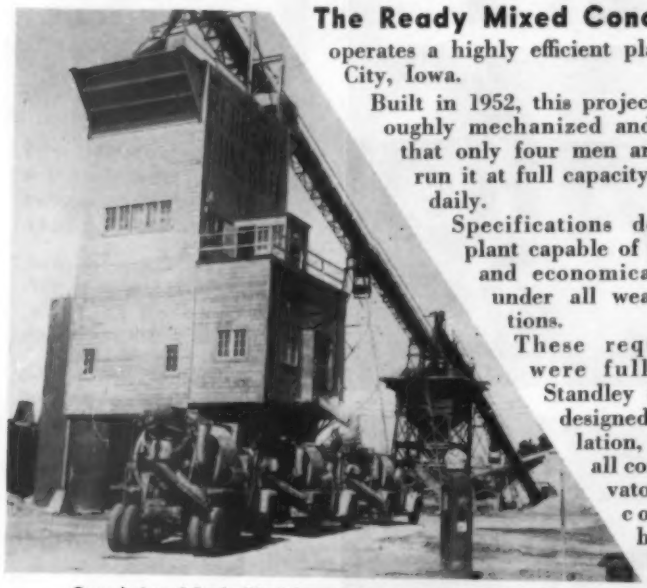
Standley

The Ready Mixed Concrete Co.
operates a highly efficient plant at Sioux City, Iowa.

Built in 1952, this project is so thoroughly mechanized and automatic that only four men are needed to run it at full capacity, 600 cu. yd. daily.

Specifications demanded a plant capable of dependable, and economical operation under all weather conditions.

These requirements were fully met by Standley & Co., who designed the installation, and made all conveyors, elevators and screw conveyors, bins, and batchers.



General view of Ready Mixed Concrete Co. plant at Sioux City, Iowa.

Standley & Co., are specialists in solving every kind of material handling problem.

Proper coordination of all factors in a storage and handling system is one phase of our service.

Required units are made in our own shops, and installed promptly and at minimum cost. Erection by us or others is optional.

Regardless of your location or type of business, consult Standley if you are stymied by a material handling difficulty.

Call for Information, with no Obligation

7143 NORTH MARKET STREET STANDLEY & Co. SAINT LOUIS 21, MISSOURI

New R.M.C. Plants Opened Continuing Expansion Trend

The number of new ready-mixed concrete plants which have been started over the last few months continue to emphasize the expansion going on in this industry.

At Kings Mountain, N. C., Ernest Spangler and his two sons have started operations in a new plant, in addition to their present facilities at Shelby, N. C.

The new concrete plant of Moberly Concrete Products, Inc., Moberly, Mo., will be operating soon, providing ready-mixed concrete and all types of concrete products and precast stone.

Operation of the new Churubusco (Ind.) Ready-Mix Company is expected soon. The firm is an affiliate of the Fred O. Carey Construction Company of South Whitley and Syacuse, Ind.

Walter Kunz, Forestville, Ohio, has added a second ready-mixed concrete plant at Tobasco, Ohio, to his present operation at Bethel, Ohio.

Sigourney Ready-Mixed Concrete Company, Sigourney, Iowa, has completed construction of a new plant, furnished with Johnson aggregate bins and Blaw-Knox automatic unloading equipment. The new company will be associated with the Ideal Ready Mix Concrete Company of Ottumwa and Oskaloosa, Iowa.

Criss and Shafer, Inc., Charleston, W. Va., well-known concrete producers with plants in Charleston and Camden, Ark., and Huntington, W. Va., have opened newly-constructed ready-mix plants at Jacksonville and North Little Rock, Ark. The Jacksonville plant is expected to have an 800-cu. yd. daily capacity and furnish much of the concrete for an air base nearby.

T and T Ready-Mixed Concrete Company, one of the newest industries of Tama, Iowa, is now in full production. L. F. Smith is general manager.

A new plant is about ready to start operations for the Ready-Mixed Concrete Company, of Union City, Pa., an affiliate of the Caflisch Builders Supply Company of that city.

The Mount Vernon Sand and Gravel Company, operating plants

at Mount Vernon and Oak Harbor, Wash., has completed the construction of a new ready-mixed concrete plant at Anacortes, Wash., according to C. J. Tjernagel, company spokesman.

F. G. Cheney and G. W. Cooper, Belleville, Mich., are partners in Modern Transit Mix, Inc., a new firm producing concrete in Battle Creek, Mich. Aggregates for the ready-mixed concrete will come from a new sand and gravel pit the company is opening near Nashville, Mich.

Royal's Redi-Mix of Vermillion, S. D., a new ready-mixed concrete firm making its first deliveries, is owned by Royal Emerson, who has operated a similar plant in Bonesteel, S. D., for the past two years.

Spencer Mohring is now operating the new plant of the Sparta Ready-Mixed Concrete Company at Sparta, Wis.

An expansion doubling the present capacity of the Ready-Mixed Concrete Company, Topeka, Kans., is under way, according to M. N. Penny, owner.

A new plant was recently opened at Rocky Ford, Colo., by the Valley Concrete Company, operated by Earl Brubaker and Victor Ullom. The property includes a sand and gravel pit, and a 100-t.p.h. crushing and screening plant for the production of aggregates.

In the Cataract Lake area, near Greencastle, Ind., the Gosport Gravel Company recently opened a $50,000 ready-mix plant. Malcolm Taylor, manager, states that the output is expected to be about 250 tons daily.

Another processor of aggregates, the McGrath Sand and Gravel Company, Chillicothe, Ill., has announced that ready-mix and concrete block are being produced by a new firm, The Ready-Mix Concrete Company, on its premises.

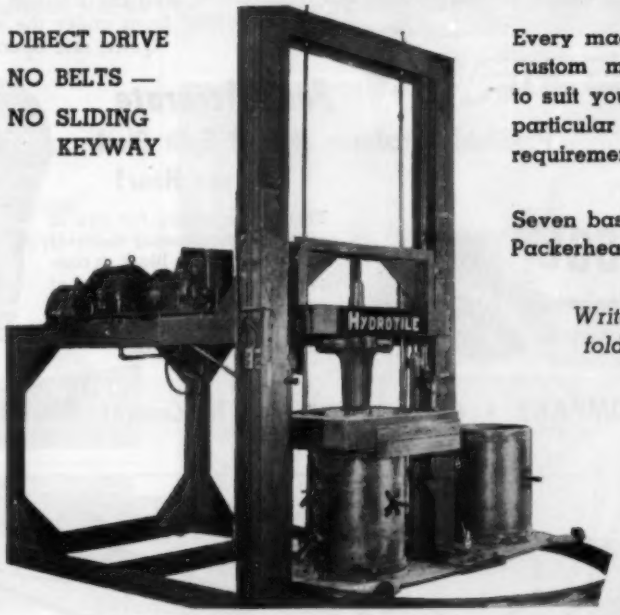
A.C.I. Publishes New Booklet Covering Cellular Concrete

The American Concrete Institute has reprinted in booklet form a paper entitled *Cellular Concrete*, by Rudolph C. Valore Jr., materials engineer, National Bureau of Standards.

Methods of preparation and physical properties of moist- and high-pressure steam-cured cellular concretes as they have evolved in Europe are covered in the treatise, which may be obtained for $1.00 per copy from the American Concrete Institute, 18263 West McNichols Road, Detroit 19, Mich.

PIPE & TILE MACHINES

DIRECT DRIVE
NO BELTS —
NO SLIDING KEYWAY



Every machine custom made to suit your particular requirements.

Seven basic Packerhead models.

Write for folders.

MACHINERY AND ENGINEERING DIVISION
Nashua Tile Co. Nashua, Iowa

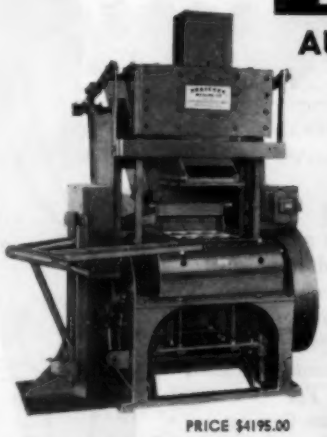
Hand Offbearing

PRASCHAK

Power Offbearing

AUTOMATIC 400 BLOCK MACHINE

NOW AVAILABLE IN TWO MODELS



- AUTOMATIC capacity of 400 blocks/hour
- VIBRATION powerful, variable, yet smooth
- PRESS HEAD pressed top blocks
- PACKER packs at rate of 200 blows/minute

COMING SOON!
Fully automatic Plain Pallet Block Machine. Write today!

PRICE $4195.00

PRICE $4445.00

We also manufacture:
Mixers, Bucket Elevators, Hammermill Crushers, Conveyors, Rotary Screens, Lift Trucks, Power Offbearers.

PRASCHAK MACHINE CO. Hwy. 13—South MARSHFIELD, WIS.

Front view showing operator feeding block into BES-STONE Block Splitter.

Make this your BEST year with the BES-STONE Block Splitter

Expand Your Opportunities — Cash in on the Split Block demand. Its "quarried stone" character pleases owners. You'll find it ideal for all structures, large or small . . . commercial, institutional or home construction. BES-STONE challenges the creative ability of both architects and builders.

Splitters in 18" and 24" sizes — Automatic, powerful, hydraulic operation . . . up to 960 Split Block per hour. Straight line cuts . . . No cull block. Easily adjustable for splitting various block heights. Block is placed under knife, automatically. And the finished Split Block is automatically removed from under the splitting knife by the incoming block. Quiet, safe operation.

Fast, Accurate

Profitable Producer of 960 Split Block per Hour!

There's big money for you in attractive, permanently colorful BES-STONE Split Block. It complements and increases sales of standard stripper block. Get all the facts. Write for BES-STONE Bulletins 95A and 100.

BESSER 50th Anniversary 1904-1954

Note the natural beauty of BES-STONE. No maintenance, no painting, no peeling off.

BES-STONE *the Split Block with Character*

BESSER COMPANY • Complete Equipment for Concrete Block Plants • Alpena, Michigan, U. S. A.

A 7908-½-HR

USE Trinity White

PORTLAND CEMENT

the whitest white cement

Trinity White is a true portland cement and has unexcelled beauty—the beauty of the whitest white . . . plus the best possible results when color pigments are added. Use it wherever you want greater masonry beauty or higher light reflection as for example: architectural concrete units; terrazzo; stucco; light-reflecting floors and walls. For descriptive literature, write Trinity White Cement, 111 W. Monroe St., Chicago.

A Product of GENERAL PORTLAND CEMENT CO. • Chicago • Dallas • Chattanooga • Tampa • Los Angeles

Industry has
A WORLD OF CONFIDENCE

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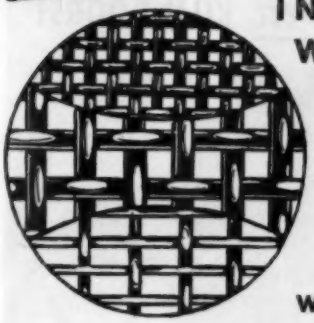
WIRE CLOTH



COVERS EVERY REQUIREMENT

. . . for a dependable, long-wearing, non-crystallising Screen Cloth. Has "Nat-Aloy" Lock Crimp Meshes. Preferred for screening accuracy, economy and serviceability. All Sizes —All Meshes—All Gauges.

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WE OFFER NOW . . .
SUPER NAT-ALOY
OIL TEMPERED WOVEN WIRE CLOTH

★ GREATER RESISTANCE TO ABRASION.
★ MORE TONNAGE AT LOWER COST.
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AVAILABLE IN FLAT SURFACE, LOCK CRIMP, DOUBLE CRIMP AND RECTANGULAR OPENINGS.
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CONCRETE MACHINERY COMPANY
Drawer 60
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NOW MORE THAN 150 LICENSED MANUFACTURERS
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Concrete STEPS

A Small Investment That Pays Big Dividends

Homeward all metal forms are precision built to produce a product that requires no hand finishing.

The exclusive franchise for your territory may still be open.

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Butt Weld
DUR-O-WAL
WITH TRUSSED
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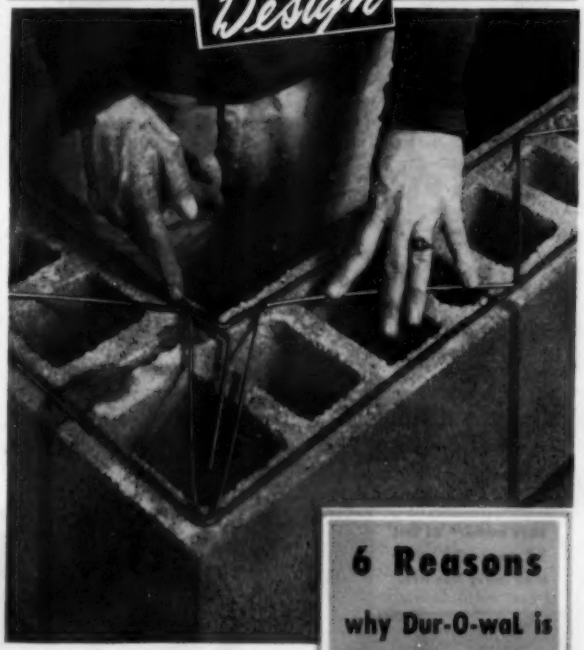

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why Dur-O-wal is
STRONGER, FASTER
AT LESS COST

• Mechanical Bond every 8 inches of wall • **High Tensile Steel** (100,000 p. s. i.), shipped in covenient 10 foot lengths • **Double Mortar Lock** at each weld • **Electric Butt Welds** place all rods on a single plane • **Knurled Side Rods** lay straight and flat due to hardness of steel • **Trussed Design** causes side rods to work together.

Patented Dur-O-wal Sets the Pace for Reinforcing Quality and Performance

Masonry industry leaders throughout the nation hail butt-weld Dur-O-wal for performance, quality and economy. Masons prefer Dur-O-wal because it lays flat . . . works fast . . . handles easily.

The masonry industry prefers Dur-O-wal because it safeguards the beauty of masonry by providing both vertical and horizontal reinforcing in all types of masonry walls.

GET ALL THE FACTS TODAY from the Dur-O-wal plant nearest you. Literature now available with new research data from independent tests. Request information today.

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To Build Modern . . . *without* Price Penalty . . . Build of Cavitex

Among today's home builders the swing is to masonry. And the ultra-modern masonry is Cavitex. With eye-appeal and price appeal, Cavitex has unusual interest for building contractors and owners alert to modern trends.

Cavitex is new—in size, proportion, design and color range. Cored-out design provides insulation values and saves weight. Easily the most practicable unit for cavity-type wall construction. Ideal also, as veneer over frame, or as facing over 4" concrete block. Available in pastel tones for exposed masonry interior walls.

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W. E. Dunn Mfg. Co., 420 W. 24th St., Holland, Mich.
CANADA: Dunn Masonry Machinery, Ltd. 866 Dundas H'way, Cooksville, Ont.

Local Manufacturing Opportunity

Many choice locations are open for the local manufacturing of Cavitex. Excellent opportunity for concrete products manufacturers. Each plant operates under franchise in protected territories. Cavitex machine available on lease or sale. If interested, ask for "Opportunity Unlimited."

X-2

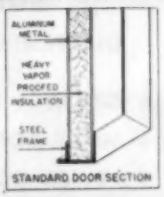
SAVE FUEL • REDUCE CURING TIME CUT COSTS • UP PROFITS with *Standard* KILN DOORS!

WHERE AISLE SPACE IS LIMITED STANDARD sliding doors need no aisle space. The carrier-type door (shown) requires 15" minimum clearance above top of door opening. A vertical sliding door, counterweighted for easy opening, is also available.

WHERE HINGE-TYPE DOORS ARE PREFERRED Choose from two STANDARD hinge-type doors. The top-hinging door (shown) can be used when there's insufficient room at sides of door. The conventional side-hinging door has rugged hinges and positive-seal lock.

CHECK THESE FEATURES

- √ Heavy Aluminum Sheets on Both Sides of Thick Vapor Proofed Insulation.
- √ Rugged Steel Frame.



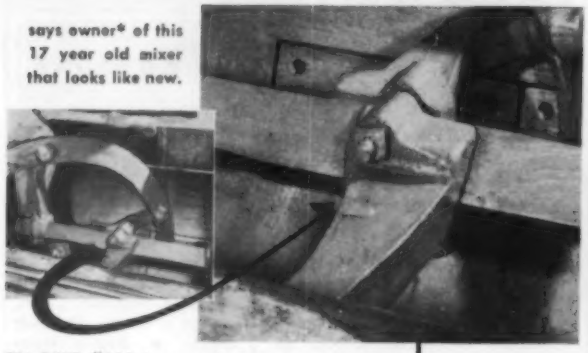
STANDARD DOOR SECTION

Get the Best — Send for Details Now

STANDARD DRY KILN COMPANY
P. O. BOX 5708 . . . . INDIANAPOLIS 21, IND.

"Cleaned with a whisk broom, putty knife and . . . EDI-COTE 103 in half the time!"

says owner* of this 17 year old mixer that looks like new.



EDI-COTE #103 is a revolutionary new release agent that prevents concrete from bonding to mixer blades and parts. EDI-COTE #103 eliminates the use of air guns and sledge hammers in the daily clean-up. EDI-COTE #103 creates a non-hardening film which prevents the forming of a bond between concrete and metal. It adheres rigidly and will not dissipate due to chemical action or abrasion. One application of EDI-COTE #103 will remain effective throughout the longest working day. EDI-COTE #103 can be applied with brush or spray. Shipped in 30 and 55 gallon drums and 5 gallon cans. Order EDI-COTE #103 today!

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Concrete Industries Exposition
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Speed Up Hand Work with the BIG BULLY AIR HAMMER

- Clean Equipment
- Shape Dry Concrete
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Clean Mixing Trucks Faster

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Vibrating Concrete From Hopper

Weight only 50 oz., 6 in. length, fits hand easily. Exclusive metering trigger delivers 0 to 9000 blows per minute. 28 tools available for 100 different jobs. Special tools made at your request.

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THREE ★ MARKET

Focus on the growing market for concrete masonry houses. Look at the opportunity it offers for three major uses of concrete products: foundations, walls and floors.

1 **FOUNDATIONS** are an important part of your market because most families want the convenience of a basement. It's easy to sell this low-cost extra space for a recreation room, workshop, darkroom, laundry or storage area.

2 **WALLS** and interior partitions of concrete masonry are gaining in popularity. Take advantage of this trend and promote the beauty, firesafety, sound absorption and ease of insulation of concrete masonry walls.

3 **FLOORS** built with precast concrete masonry units are rigid, creak-proof and firesafe. Homeowners will want features like these if you tell them how economical they are.

This three-star house market constitutes your greatest potential for new sales. And Portland Cement Association advertising in housing magazines paves the way for you. Back it with your own advertising and other promotion.

PORTLAND CEMENT ASSOCIATION
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A national organization to improve and extend the uses of portland cement and concrete through scientific research and engineering field work

truck-men DO MORE FOR LESS . . . Says F. F. KIRCHNER

Model 40 loading a cube of blocks on truck

Model DHP with empty rack in front of kiln

"We have one two-ton Truck-Man Model 40 High Lift and two 4,500 lb. Truck-Man Model DHP's," says Mr. Kirchner, of F. F. Kirchner Material Company, St. Louis, Missouri. "What a combination! One DHP shifts loaded racks from the block machine to the kilns, from the kilns to the cubing area and then takes the empties back to the machine. The 40 takes the cubes to the yard, loads cubes from the yard on highway trucks and even unloads bagged cement and other materials that we receive. The other DHP is used for odd jobs and as an auxiliary in shifting racks when we are rushed.

"We've really got the handling problem licked now," he continues, "That DHP is the most efficient little work horse I've seen and it's so darned economical. Moving loaded racks eight hours a day on two gallons of gas —it's almost unbelievable.

"As for the Model 40, it's easy to see that it was designed from the ground up for block plant use.—Rugged, maneuverable, plenty of power, easily maintained and those big tires can go any place.

"Like everyone else, we're watching costs these days. So we were pleasantly surprised to find we could buy all three of these trucks for a lot less than the cost of two ordinary fork trucks. Our experience has proved to us that they are more efficient and versatile, too."

For information on how Truck-Man can cut costs in your operation, complete and mail this coupon today.

truck-man

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You'll find Vibrapacs are versatile. They not only make conventional block in all types and sizes, and brick 32 at a time . . . they also make Soffit Filler Block for floors and roofs. And the same set of Plain Pallets takes care of ALL units. Write for literature.

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Complete Equipment for Concrete Block Plants

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Boost CONCRETE PROFITS

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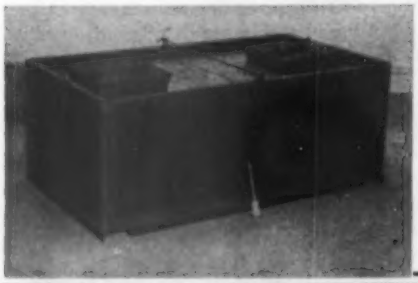

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NO SEAM HERE
The wing thumb construction multiplies glove life.

TOUGHEST WHERE WEAR IS ROUGHEST

Putting the wear in gloves at the right point really helps reduce glove costs and with Tripl-Palm you get an added cushion for hand comfort. Tripl-Palms are available in knit wrist, and gauntlet styles and coated or "free-breathing" backs. At your Jobber or write for information.

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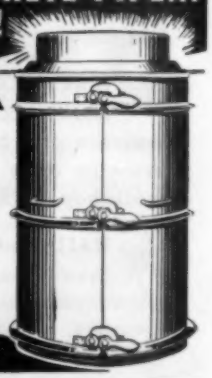
THE SURETY RUBBER CO.
CARROLLTON, OHIO

FOR THE FINEST CONCRETE PIPE... YOU NEED FINEST FORMS!

THE Quinn Standard



Backed by over 40 years of reliable service, the QUINN STANDARD is recognized as the finest concrete pipe form the world over. Thousands of pipe manufacturers, from the smallest to the largest, look to Quinn for equipment to produce the finest concrete pipe at the lowest possible costs.

• **QUINN HEAVY DUTY PIPE FORMS**

For making pipe by hand methods by either the wet or semi-dry process. Sizes for pipe from 10" to 120" and larger. Tongue and groove or bell end pipe in any length desired.

WRITE TODAY for complete information and estimates.

Also manufacturers of QUINN CONCRETE PIPE MACHINES

Quinn WIRE & IRON WORKS
BOONE, IOWA

Prescription for Premium Concrete

[SC]² BATCHING CONTROL

Leading concrete producers are standardizing on [SC]² Control because it provides batching accuracy and automatically compensates for moisture content of aggregates. View at left shows a typical [SC]² installation in a large West Coast plant. This shows the [SC]² Batching Control Assembly, with air valves for admitting cement, aggregate and water to weigh hoppers. Cut-off of all ingredients is automatic. Weighs to close tolerances with an automatic record of all delivered weights.

Complete Information sent on Request

SEE US AT THE MIAMI CONVENTION, PLAZA HOTEL.

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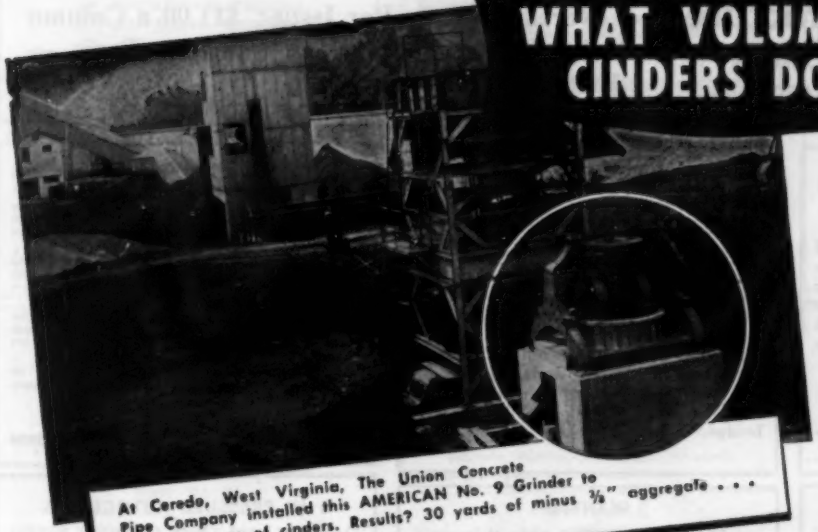

At Ceredo, West Virginia, The Union Concrete Pipe Company installed this AMERICAN No. 9 Grinder to work on acres of cinders. Results? 30 yards of minus ⅜" aggregate . . . every hour, every day.

Select from 8 AMERICAN Grinders Hourly Output 4 Yards to 75 Yards!

Write your own ticket for your plant's cinder-grinding requirements . . . one of the 8 AMERICAN Grinders will give you the output needed . . . deliver minus ⅜" mesh aggregate without additional separation! Your AMERICAN Grinder will require minimum maintenance . . . will conserve power . . . will help produce low-cost, top-quality cinder block. Write . . . wire . . . phone . . . ask for an AMERICAN grinding expert to help you lick your problem.

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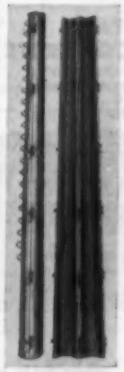
No. 5	4	No. 9	30
No. 6	6	No. 9A	30
No. 7	12	No. 418	50
No. 8	20	No. 384	75

American GRINDERS by

W. A. RIDDELL CORP.

BUCYRUS, OHIO



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Made of Cold Rolled Sheet Steel

This low-investment business-booster is easily set up . . . requires no additional space, and no power. Makes pre-stressed posts in large demand everywhere. Expand your income with this sure-fire item!

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OUR 100th YEAR: 1854-1954

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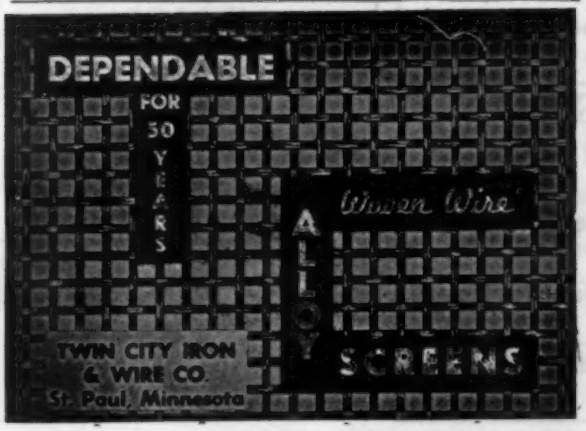

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#1 Jaeger Mixer Model 3-H.M. 1947, Serial #J.8990, powered by 6-cylinder Continental Motor Model F 226.

Mounted on White Truck W.B. 2264 1947 Model #1500 Timken Tandem Axle. 160" wheelbase, 9.00 x 20 tires. Air brakes.

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All shades and grades the highest quality.
Write for color cards, prices and samples

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Established 1885

PLAIN PALLETS CLEANED
in your plant
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we use Besser Equipment

FOR SALE

One Concrete Pipe Off-Bear Cart. Will off-bear sizes through 60". Equipped with two hydraulic lifting jacks. Actually used 90 days and guaranteed in perfect condition.

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Conveyors—Bucket Elevators—Batchers—Scales—Unloaders, for ready mix or block plants. Complete plants erected or will rebuilt your present one. References.

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Complete Catalog on Request.

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Consultant on Autoclaving
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Raw Materials - Formulation - Research
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1—3 Material Low Binanbatch (or comparable) equipment with traveling weigh batcher. Also I need 5 H.P. compressor or Roots Blower.

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FOR SALE

2 Doswell-Kover Air Seal Vault Molds —one sack Jaeger Mixer with power loader, electric motor & speed reducer —12 cu. ft. Products Mixer (nearly new) with electric motor, speed reducer & belt conveyor for charging—all of this equipment is in good condition.

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For Best Results

Advertise In The

Concrete Manufacturer

Classified Section

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SIZES 12-INCH THROUGH 18-INCH

(a) 18-inch concrete pipe molds in 3-foot lengths with 2 bottom pallets and 1 top header for each mold. We have 20 of these molds, 5 of which are Quinn Standards.

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This equipment is in good condition and will be sold very reasonably for a quick sale. Contact: A. C. Gossett.

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6 HI PRESSURE AUTOCLAVES

IMMEDIATE DELIVERY WITH QUICK ACTING DOORS. EACH KILN 6'-6" IN DIAMETER AND 65' LONG. PRICED FOR QUICK SALE. IF YOU ARE INTERESTED IN HIGH PRESSURE CURING IT WILL PAY YOU TO INVESTIGATE AT ONCE.

DINABURG BLOCK CO.
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MINERAL COLORS
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BRICK MORTAR STUCCO-PLASTER-CONCRETE
"Fine Because of Their Fineness"
Ask for samples and recommendations.
BLUE RIDGE TALC CO., INC.
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THE BUY OF A LIFETIME
Complete Block Plant For Sale—In Operation NOW!
One Kepler Block machine (Plus two machines of the same make for parts).
Twelve thousand cored pallets—4", 6", 8", 10", 12"; Plus corner and sash pallets, also pallets for 4" and 10" termite blocks.
Mold boxes for all sizes.
200 pans for 24"x24"x2" stepping stones (We make these stepping stones on our block machine, 200 stones in 3 hours).
35 steel racks (72 and 48 block capacity).
One two-bag mixer complete with starter and a 15 HP. motor.
One Truckman high lift.
Two hand lift trucks.
Two 1950 Dodge trucks, 1½ tons.
We make 2,800 blocks in 8 hrs. Make 4 blocks at a time. We are making blocks now and will demonstrate.

PRICE: $9,000.00
ROTH BROS. CONCRETE BLOCK CO.
RD. 3, IRWIN, PA.
On Lincoln Highway (Rt. 30) on half of a mile east of the Turnpike Entrance. Tel. PNdorhill 3-7750.

FOR RENT

Several 5 & 6 yd. Ready Mixed Concrete trucks & Mixer with operator.

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STOP *that* WATER

With FORMULA NO. 640

A clear liquid which penetrates 1" or more into concrete, brick, stucco, etc., seals—holds 1250 lbs. per sq. ft. hydrostatic pressure. Cuts costs: Applies quickly — no mixing — no cleanup — no furring — no membrane. Write for technical data—free sample.

HAYNES PRODUCTS CO., OMAHA 3, NEBR.

FOR SALE
AT SACRIFICE PRICES
USED MOLD BOXES
FOR
BESSER VIBRIPACK MACHINES

2 Mold Boxes to make 3-7⅝ x 15⅝ Blocks
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1 Mold Box to make 3-7⅝ x 15⅝ Full Cut Out Header Blocks

Above in good condition with Stripper Heads ready to use. Parts also available to make Sq. corners, bull nose corners, bull nose sash blocks, halves, etc.

DOMINE BUILDERS SUPPLY CORP.
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WANTED TO BUY

2 cubic yard used stationary mixer. Prefer Rex or Koehring.

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FOR SALE

1—Vibrator Block Machine
800 Pallets, 8 x 8 x 16
Makes 800 Blocks 8 hrs.
Price $750.00, including Mixer.

BARTL CONCRETE CO.
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One—F. C. George Press Pac series 400 A-1 Condition with 4" 6" 8" and 12" attachments including pallets. Reason for selling, installing larger machine.

One—Stearns 18 C.F. Skip Hoist like new. Complete with controls.

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1—Kent Tamper Stripper Block Machine, A-1 condition, 4", 8" and 12" mold boxes.
1600 Various Size Pallets for above.
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4—10' Pieces Roller Conveyor.
Also 4800 6", 8", 12" Steel Pallets, Pressed.
Priced for Quick Sale—All or Part.

MARION BLOCK CO. Cynthiana, Ky.

LOWER COST
PACKER-HEAD WINGS
Proved to last as long or longer — yet cost considerably less. Write for prices.
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WANTED TO BUY
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and
Dunbrik Machine

Including carts, pallets, mixers, for above, reply to:
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IMMEDIATE DELIVERY

Factory Rebuilt Columbia Model #8 Automatic complete with 8" Standard Mold.....$7500.00
Also Semi-Automatic Model #8 complete with 8" Standard Mold..... 5500.00
F.O.B. Mukwonago, Wisconsin

CONTACT
Columbia Machine, Vancouver, Washington
or
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Furnished from prime domestic open hearth mild steel plate.

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Handles and stockpiles cubed blocks—loads delivery trucks. Model F-6R shown, capacity 6000 lbs. Other larger and smaller sizes for any job.

Here's the pair of Ericksons that have proven themselves the BACKBONE OF BLOCK PRODUCTION. Erickson's rugged dependability and long life have won its reputation as "the workhorse of lift trucks". Erickson trucks are custom-built to fit your needs.

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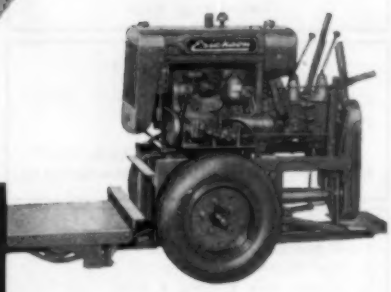

Picks up all block racks from the ends and places them close together in kiln—no wasted space. A sensational new Erickson platform design is on the way.

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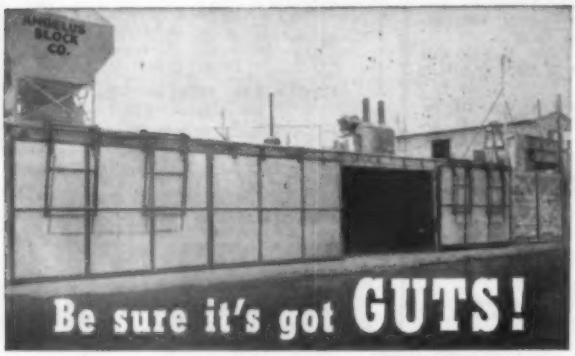

Be sure it's got GUTS!

Above: Universal Doors and Carriers in use at Angelus Block Co., Burbank, Calif., one of the West's oldest and largest block producers.

Kiln closure equipment is no place for tin-pan construction. Be sure the equipment *you* buy has the *guts* to give you efficient operation and long trouble-free service. Write, wire, or phone for detailed information.

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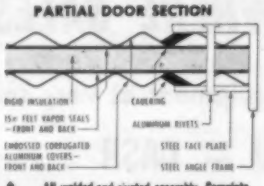
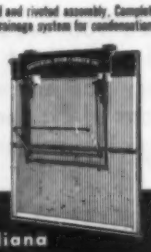


All welded and riveted assembly. Complete internal drainage system for condensation.



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KILN DOORS and DOOR CARRIERS
50th Anniversary 1904-1954

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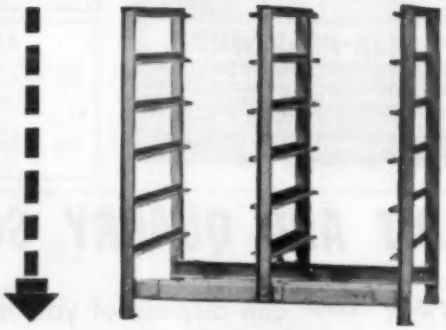
1117 Cornell Ave., Indianapolis 2, Indiana
"SPECIALISTS IN KILN CLOSURE EQUIPMENT—SINCE 1904"

CHASE BLOCK RACKS, PLAIN STEEL PALLETS

Your best buy



Here's why • • • Standard style or specially designed, Chase racks meet your requirements. They're shipped painted and knocked down—assembly is easy—no special tools or welding needed. Chase experience means low prices and years of dependable service. Check Chase prices.

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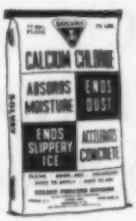

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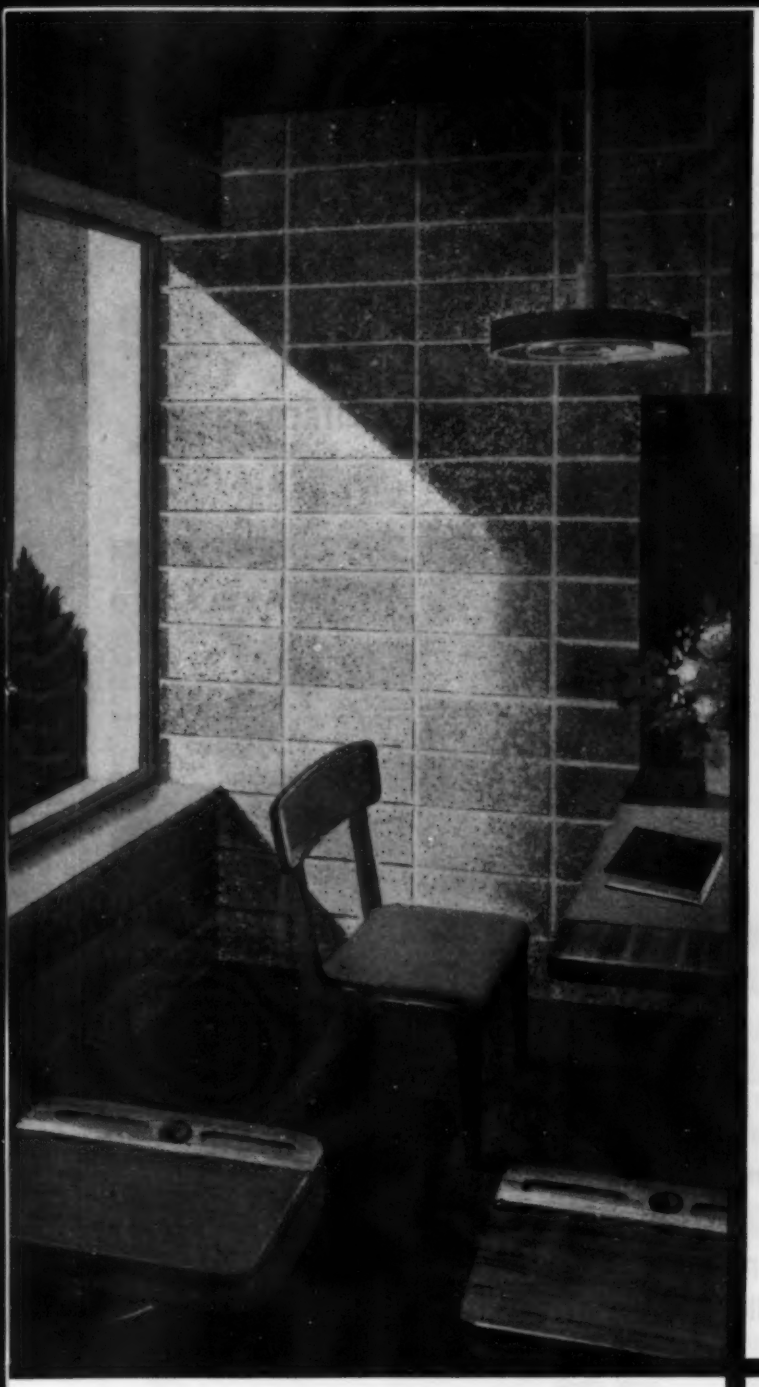


A WAYLITE SURFACE

needs no acoustical treatment

In addition, it has high thermal insulative qualities . . . offers many decorative possibilities . . . it is low in cost . . . fire-safe

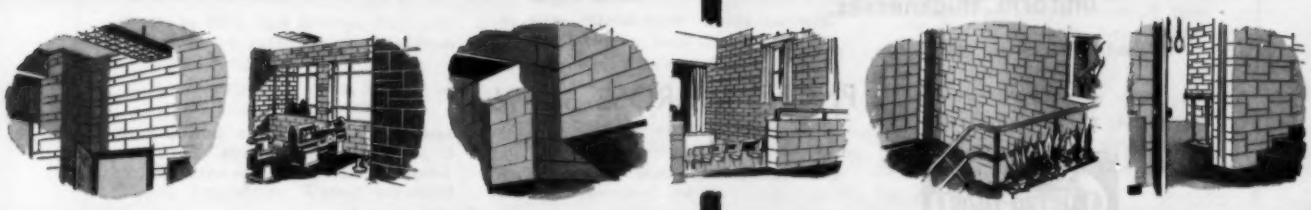
A large number of schools are being built these days of Waylite concrete masonry units.

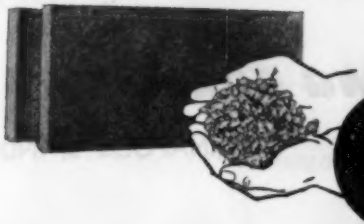
The fact that the exposed surface of Waylite is one of the most efficient acoustical treatments known is in part responsible. Rooms that are comfortable to the ear are equally important in churches, auditoriums, offices, and many other structures.

Exposed Waylite is not only comfortable to the ear, but it is pleasing to the eye. The unit patterns shown give some idea of the varied decorative effects that can be easily achieved. The natural surface of Waylite units is attractive in color and texture. Units may be painted—or pigmented during manufacture.

Waylite concrete masonry units are structurally adequate and give a combination of four important factors: (1) high thermal insulative qualities; (2) excellent acoustical values; (3) a wide range of decorative possibilities; (4) low in cost—and fire-safe.

You will find 24 pages of engineering data on Waylite in Sweet's Catalog. Additional information is available on request. Address the Waylite Company, 20 North Wacker Drive, Chicago, Illinois or Box 30, Bethlehem, Pennsylvania.





WAYLITE

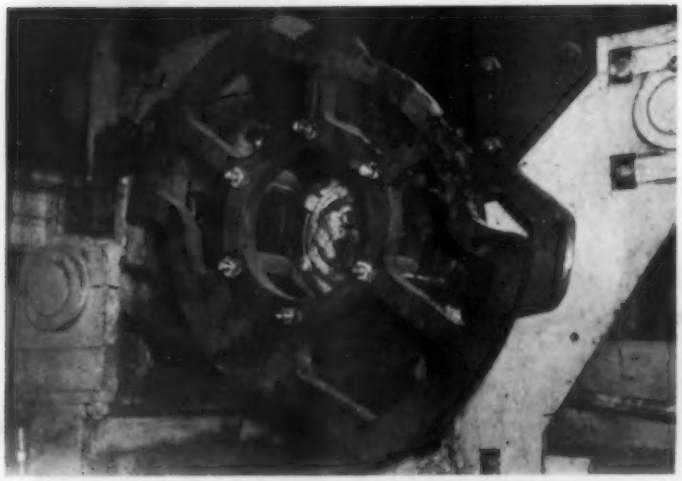
MASONRY UNITS

BETTER BLOCK MAKING MACHINERY

ELECTRO –VISOR

— HEIGHT MAINTENANCE
— AUTOMATIC FEED CONTROL
— HI-PRO CAMS

Production Up
To 1200 Blocks
Per Hour with
No Loss in Strength.
Ask Any of the
40 or More Users
Of Electro-Visor



VIEW OF PALLET RECEIVER HI-PRO CAM
INSTALLED ON BESSER AT YORK, PA.

HI-PRO Cams slow down machine operation without slowing production. The conventional cams on the Besser Vibrapac make one pallet of block per revolution of cam shaft. BUT HI-PRO Cams make two pallets of block per revolution, resulting in block being handled slower, less machine wear, positive feed control, positive height control on clean pallets of uniform thicknesses.

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AUTOMATIC ELECTRO-VISOR QUALITY CONTROL

M & M ENGINEERING CORP.

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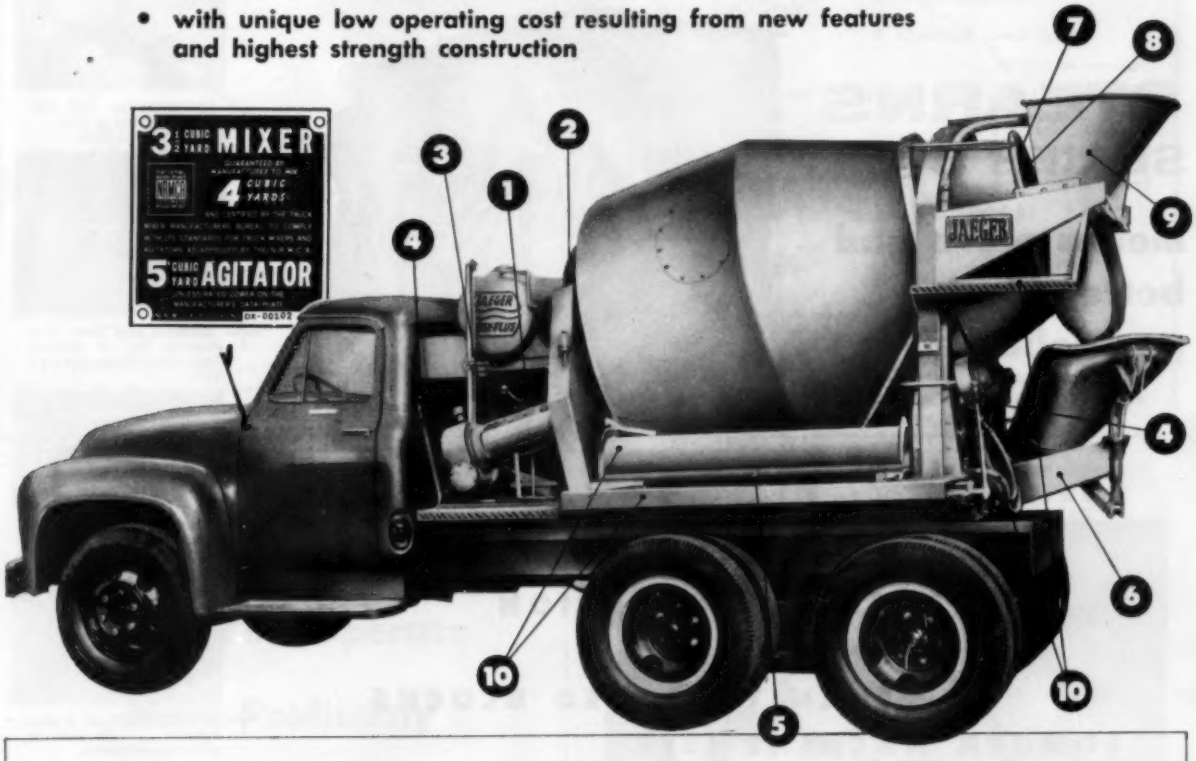
Jaeger's new standard 3½-4 yd.

- **Hauls 3 to 3½ yd. legal payloads on single axle trucks**
- **4 to 4½ yd. legal payloads on lightest tandem axle trucks**
- **with unique low operating cost resulting from new features and highest strength construction**



We will demonstrate this new 3½-4 yd. open end loader, and our latest 5½ yd. sealed end loader, at Booth 23-30, Concrete Industries Exposition, Cleveland, Ohio, January 24-27.

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2: **Heavy duty drive chain.** Same as on biggest mixers. No breakdowns.

3: **3-speed transmission, another Jaeger first.** 3 mixing speeds, 3 discharge speeds provided by standard, long-proven Warner industrial transmission. Drum speeds from 1½ to 15 rpm are all at economical engine speeds of 800 to 2000 rpm.

4: **Instant, exact drum control by single lever.**

5: **New "Quick-Lock" chute carriers.** Save operator both time and effort.

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7: **"Quick-Way" water injector.** Eliminates water bells and packing glands.

8: **25% larger discharge blades.** Fastest discharge of low slump concrete.

9: **Improved type open-end loader.** Steeper angle and bigger throat for fastest charging.

10: **Standard equipment** includes full-length mudguards, wash-off hose, 3-piece 12 ft. chute, fuel tank and hopper inspection platform.

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COMPRESSORS • LOADERS • PUMPS • CONCRETE MIXERS • PAVING MACHINES

no matter how you figure...

STEARNS SERIES 50 *

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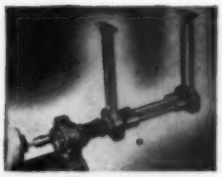

EXCLUSIVE Dual Shaft Uni-Directional Vibrating Unit . . . for even textured blocks.

+ MASSIVE steel drive shaft measures 5½" in diameter. Taper insures proper cam alignment.

+ TIME-TESTED Mold Box and Packer Head . . . facilitates changing of attachments.

+ PERFECTED Feed Drawer Agitation . . . fills mold box uniformly and quickly.

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FASTER PRODUCTION
LESS DOWN-TIME
EVEN-TEXTURED BLOCKS
LONGER MACHINE LIFE

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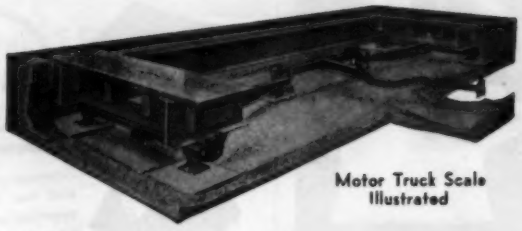

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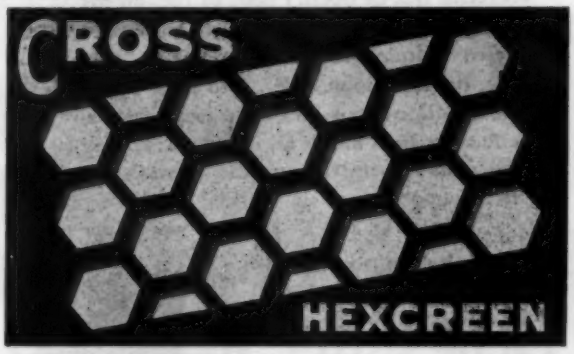

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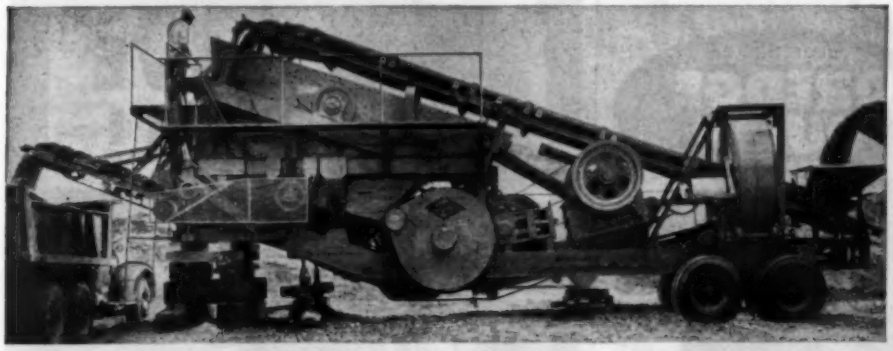

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Decks can be changed fast and efficiently cutting time and labor costs. Available in any desired shape and size of perforations in high carbon steel and stainless steels and other commercially rolled metals, Hendrick Perforated metal is supplied flat or corrugated. For more details write Hendrick, today!

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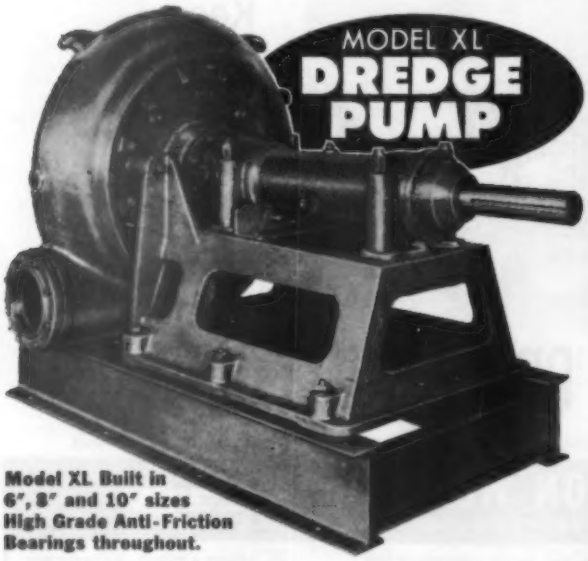

Model XL Built in 6", 8" and 10" sizes
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For RIGIDITY while pump is in operation, shell is mounted direct to base by means of solid, one piece casting. For GREATER PRODUCTIVITY (10-15% higher solids output than comparable pumps), EASIER MAINTENANCE (impeller replaced in hours instead of days) and ECONOMY in first cost, replacement cost and operating cost look to LIGHTNING the complete line (3" to 10").

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Needed for southern or mid-western plant of portland cement manufacturer. Prefer man under 45 years of age with proven experience as head of cement plant laboratory. Will also consider an up and coming assistant chief who is anxious to get ahead and who has sufficient educational background to make the grade. Include in your reply details of experience and training, age and pertinent personal data. Reply to

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All prices cheerfully quoted.

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Large well-established middlewestern company needs man with minimum of five years experience who carried full responsibility for the manufacture of concrete pipe, block, or allied field to take charge of all activities in plant having 50-man work force. Qualifications include ability to direct and get along with men, production know-how, cost consciousness, technical competence to rebuild present plant, and ideas for constructing new facilities for future expansion program. Age 35 to 45. Good salary and outstanding profit-sharing plan. Please reply, giving personal, educational and work history, including present or last salary.

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We own an unlimited deposit of high-grade quartzite in Wisconsin with ideal track facilities. Want party capable to quarry and crush same under long-term contract. Have large market and will buy output. All year round operation. An exceptional opportunity for right party.

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WANTED!! ABANDONED SLATE QUARRIES

Please contact us stating location, size, condition, etc.

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FARREL-BACON JAW CRUSHERS
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Mid-Western Cement Plant is looking for an engineer experienced in concrete construction to travel as field service engineer. For complete details, Write:

BOX NO. B-20, c/o PIT AND QUARRY PUBLICATIONS
431 South Dearborn Street Chicago 5, Illinois

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Would like to contact party that is financially capable to set up machinery to produce agriculture limestone and road rock near Newton, Illinois. The supply of rock is unlimited which meets all state specifications. There is a huge market for all production.

BOX NO. PQ-103, c/o PIT AND QUARRY PUBLICATIONS
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Crushing Plants
Cement Plants
Storage Methods
Operating Costs

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Consulting Engineer

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Phone: 1828

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Chicago 6, Ill.
Ph. FR 2-4186

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We need a block plant superintendent to handle the maintenance of a Besser Super - Vibrapac Machine, and other allied equipment, such as Clark Fork Trucks and Campion curing equipment. Our total annual production is about 1,500,000 blocks. We want a man who has block plant experience, is honest and believes in a quality product, and can operate a plant as efficiently as it should be. If you qualify, we guarantee that you will be satisfied with the contract we offer.

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500 cu. ft. Ing. Rand, 100#, Waukesha gas or Waukesha-Hesselman Diesel, on 4 pneumatics or steel wheels.

315′ new Chgo. Pneu., Diesel powered, 4 pneu. tires, $2000.00 under list price.

315′ Ing. Rand, gas powered, 4 steel wheels, old but in good shape, $500.00.

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Mdl. 255A P&H #8243, 30-40′ boom, Chrysler gas eng., cap. 8½ ton @ 12′.

Mdl. 304 Koehring, ¾ yd. #C5934, 35-50′ boom.

Mdl. 77 Lorain 1½ yd. Diesel Crane, 45-85′ boom, 20′ jib, wt. 40 ton.

655-A P&H 1½ yd. Diesel Crane, hi gantry, 80′ boom.

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20 ton American Terry Steel Erectors Guy Derrick, 110′ mast, 100′ boom.

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12″ Dayton Dowd, vertical 50 HP, 3/60/220/440, 6,000 GPM @ 19′, 4250 GPM @ 32′.

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Mdl. 501 Koehring #1071, 1¼ yd. Crane, Mdl. K Wisc. gas eng., 60-80′ boom, 18′ jib, cap. 20 ton @ 12′.

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30 ton Mdl. F OHIO #3266, 50′ boom, oil fired, Nat'l. Bd. 200# boiler, beautiful shape; good buy.

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American 2-speed Band Friction Dragscraper Hoists, 125 HP 3/60/220 slip-ring motor, drum controller, grids, rated 6 ton @ 250 FPM for digging and 2½ ton @ 600 FPM for hauling.

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Approximate size 18—30
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1—24" x 72'6". 1—18" x 156'0".
Also Feeder Hopper (Used 1 Yr.) for 48" x 14'0". H. D. Kennedy Rock Feeder.

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1—3' Symons Cone Crusher, with fine crushing chamber. Must be in excellent condition.

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2—Allis Chalmers 10" Superior McCully Crushers, V-belt drive.
1—Allis Chalmers K-9 Gates Gyratory Crusher.
10—Jaw Crushers 5" x 6" to 42"x48".

Screens-Separators
6—Tyler Hummer Screens 3'x5', 4'x5', 4'x7', 4'x10', 5'x10', 4'x15'.
1—Link Belt 3'x8' double deck Screen.
5—Rotex 40"x84", 40"120".
4—Air Separators 6', 8', 10', 14'.

Other Items
2—Chicago 14"x7" Air Compressors, 434 cfm.
2—Oliver Rotary Dewaterers 8'x4'.
12—Bucket Elevators 20' to 75' centers.

COMPLETE LIME HYDRATING PLANT consisting of two #3 Clyde Hydrators, two #1 Raymond Mills, Elevators, Conveyors, etc. Send for Details.

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48.6 CFM 3500 psi 3 stage Ingersoll Rand 25 HP.
122 CFM 100 psi 7x7 Worthington HB 20 HP Elec.
125 CFM 100 psi 6¼x4½ Davey VB9, 6 available.
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1723 CFM 110 psi "XPV" 4 cor. Ingersoll Steam.

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Portable—15 CFM to 600 CFM.
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1—26,000# Vulcan, Sgl Drum AC with MG Set Complete
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1— 6,000# Brownie Carspotter AC
1— 5,000# Link-Belt Carspotter AC
1—20,000# Amer. Hoist Carspotter AC
1—20,000# LB Endless Puller

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1—18x20 Eagle Dbl Roll
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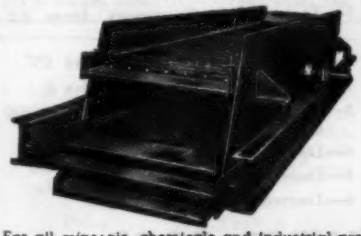

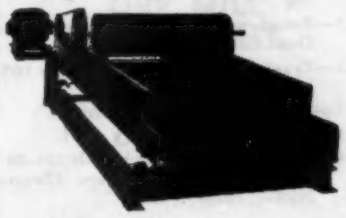

For all minerals, chemicals and industrial products. To size, grade, clean and separate solids from liquids. Heavy duty models are 4-bearing, positive throw eccentric shaft type, 3'x8' to 5'x14', 1 to 5 decks, other models have eccentric weight mechanism, spring mounted; 1 to 3 decks; from 2'x4' to 3'x8'. All models low priced, with minimum maintenance and power consumption.

Heavy Duty prices from.....**$1095.00** **General Purpose** prices from.....**$385.00**

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Complete Ready-Fab sections quickly and easily joined together on the job. We take our loss on our stock of short length belting. You can save as much as 50% on the BONDED CONVEYOR SPECIALS listed, with conveyor belting in two pieces. Conveyors are equipped with 5" roll diam. idlers and return rolls, 20" diam. head pulley and 16" diam. tail pulley mounted on 2¼" or 2-7/16" diam. shaft. Belt is new 4-ply, 28 oz. duck, 1/8" top rubber cover x 1/32" bottom cover and is fresh stock made by leading manufacturers.

Belt Width	Length of Conveyor		List Price	Sale Price
16"	20'		$ 991	$ 548
16"	45'		1785	937
18"	25'		1229	684
18"	45'		1839	1005
18"	85'		3209	1665
18"	100'		3704	1912
24"	25'		1322	773
24"	45'		2062	1145
24"	100'		4097	2166
24"	130'		5207	2773
30"	24'		1421	847
30"	65'		3101	1718
20"	30'	(5-Ply	1453	864
20"	50'	Belt)	2189	1301

Other lengths & belt widths at bargain prices.

Remember, You Save Up To 50%

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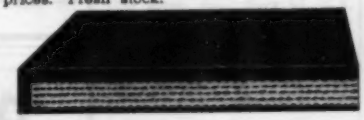
Save 28%

Heavy duty 4-ply, 28 oz. duck, 1/8" top rubber cover x 1/32" bottom cover rubber belting having high tensile strength, tough cotton duck, strong carcass and proper flexibility. For heavy boxes, bags and bulk materials. Troughs easily. Famous brands at deep cut prices. Fresh stock.



Width	List Price	Sale Price
16"	$3.64/ft.	$2.62/ft.
18"	4.03/ft.	2.90/ft.
24"	5.23/ft.	3.76/ft.
30"	6.39/ft.	4.60/ft.

Additional widths and plies available at low prices. Write for free sample.

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For stationary and portable applications. Scales have steel lever system complete with structural steel weighbridge. Capacities to 50 tons. Recording beams available.

26 Ton Truck Scales (Pit Type).....**$ 782.00**
30 Ton Truck Scales (Portable)..... **1530.00**

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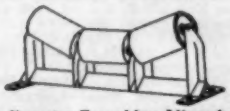
25% Below List Price



3-roll, 5" diameter Troughing Idlers for

16" belt	$17.25	30" belt	$19.50
18" belt	18.00	36" belt	20.25
24" belt	18.75	48" belt	21.75

1-roll, 5" diameter Return Idlers for

16" belt	$6.75	30" belt	$ 8.25
18" belt	7.13	36" belt	8.75
24" belt	7.50	48" belt	10.25

All steel. Interchangeable with other well-known makes. Replaceable ball bearings. Either sealed type (pre-lubricated) or with alemite fittings. Rust proof ball races. Maintenance is negligible.

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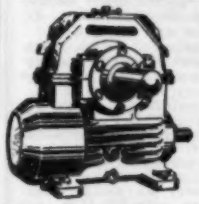

HP	Ratio	Price
3	20:1	$ 81.00
5	20:1	142.00
10	20:1	228.00
15	20:1	286.00
2	30:1	81.00
3	30:1	142.00
5	30:1	228.00
7½	30:1	228.00
10	30:1	286.00
15	30:1	394.00

Reducers are right angle with worm on bottom (underdriven) and all models are fan cooled. Other sizes and ratios available at bargain prices.

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Special.—Model LS-85 Link Belt ¾ yd. dragline with Caterpillar D-318 power unit.

Bay City 45 dragline	Pioneer 18V port. gravel plant	2x6 screen
Insley K-12 dragline	Koehring 503 crane; Cat. engine	16x16 roll crusher
Lorain 30 dragline	Lorain ⅝ yd. dragline; 30" shoes	40' bucket elevator
Link Belt LS-75 crane	Pioneer—Mesabi 5x12 screen	45 ton bin
Butler Carscoop	Pioneer—Mesabi 4x16 screen	Lessman loader

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1—Traylor Rotary Kiln, 10'6" D x 105' L, ¾" welded shell
1—Steel Ball Mill, 6' D x 16' L
3—Pebble Mills, 4'6" D x 12' L
4—Muffle Furnaces, each with (2) 24" dia. x 8'6" long rotary Chrome Nickel Alloy Tubes.
1—Jeffrey Pivoted Bucket Carrier, 185 lin. ft., 16" x 18" pivoted buckets
3—Trough Belt Conveyors, from 22' to 35' long
4—Pan Conveyors, from 12' to 95'
1—Bucket Elevator, 95' H; 10 x 6
2—Spencer Turbo Compressors—1200 CFM and 4000 CFM
4—Dorr Thickeners, 15' Dia.
1—Dorr Thickener, 22' Dia.
6—Dorrco 3" Slurry Pumps.

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SINK FLOAT PLANT: Mobil two-unit with two 7 ft. dia. HMS Separating Cones with screens, pumps, magnetic separators, densifiers, demagnetizing coils, piping, valves, framework, etc. with all control equipment.
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Bucyrus Erie 100-B, 3 yd. rock dipper.
Bucyrus Erie 120-B, 4 yd. rock dipper.
Bucyrus Erie 170-B, 6½ yd. rock dipper.
3 phase, 60 cycle, 2200/4000 volt.
COMPRESSORS: 2—Ingersoll Rand PRE-2, 14 x 22 x 16, 264 H.P., 225 RPM, 2200 volt, synchronous motors.
BLAST HOLE DRILL: Bucyrus Erie 42-T with 9" bit and tools, hydraulic jacks, diesel motor drive.
BELT CONVEYOR: Robins 24" complete with roller bearing troughing and return idlers, head and tail pulleys, motor and drive, 1100 ft. ea. NEW condition.
OVERHEAD ELECTRIC CRANES: Whiting 8 ton, 54' span, 4 motor, clam shell bucket operating, 440 volt, 3 phase, 60 cycle. Several other cranes both AC and DC, various spans, 5 tons to 55 tons.
LOCOMOTIVE CRANE: Link Belt 25 ton capacity, standard gauge, gasoline powered, cast steel trucks, air brakes, with or without 1¼ yd. Williams clam shell bucket, thoroughly modern, excellent condition. Located Minnesota. For sale or rent.
LOCOMOTIVES: 2—65 ton diesel electric, standard gauge, thoroughly modern, excellent condition. For sale or rent.
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HOIST MOTORS:
300 H.P., 435 RPM. 600 H.P., 710 RPM.
400 H.P., 588 RPM. 1200 H.P., 444 RPM.
2200 volt. A.C., with controls.
CLASSIFIERS: Akins 54" and Wemco 78", single screw. NEW condition.
PULVERIZERS: Marcy 6' x 12', trunnion and bearing type, with 200 H.P., 440 volt, motor, with stone or steel lining. Hardinge 5' x 22" Ball Mill complete with motor driven disc feeder, 30 H.P. motor and control. Also, Hardinge Conical Mills 8' x 36" and 8' x 24", helical gears, speed reducers and motors.
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25 ton Orton Diesel Locomotive Crane.
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1200 CFM Ing. Rand XRE, 200 HP Compr.
50 Steel Dump Cars 36" Ga., 12 ton.

Mississippi Valley Equipment Co.
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SB-10 Wood, coal capacity 6,000 lbs. per hour. Can furnish engineering help for adaption to lime burning.

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Shaft and bearing assembly for 1540 Champion Good Roads jaw crusher. Also tapered shaft for 1030 Good Roads.

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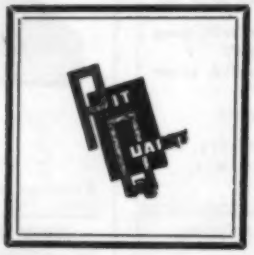

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KOEHRING #605 1½ cu. yd. Shovel. Cat. D-13000. Completely overhauled. $21,500.00.

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Model 6 N.W. Shovel 1½ Yds. Diesel
A-1 Condition

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2 Cu. Yd. SHOVEL, 1949 Machine

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Crane—Used Lima Model 34 size ⅜ yard clamshell machine with 35 ft. boom, Buda Gasoline Engine and electric starter. Reconditioned.

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Crane and Backhoe—Used Osgood Invader ½ yard powered by gasoline engine. 40 ft. crane boom. Rudomatic Tagline and dragline fairleads.

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1—4½' x 30' Bonnot dryer.
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1—36" x 16" Sturtevant crushing rolls.
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1—Farrel 24" x 12" crushing rolls.

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4—26"x15" Sturtevant Roll
2—32"x36" Roll
3—36"x36" Roll

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1—12"x12" C.P., Class NSB 392 ft.
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27—Addt'l. pumps, Centrifugal, Triplex, Vacuum, & Sump, up to 5650 GPM.

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1—24' Dorr Bowl with 8'x32' rake section.
3—Dorr 8'x34", 3 deck, 2 section.
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1—6'4½" Dia. x 12' L. Link Belt, Roto Louvre Dryer with Maehler oil heater.

RR TRACK SCALES

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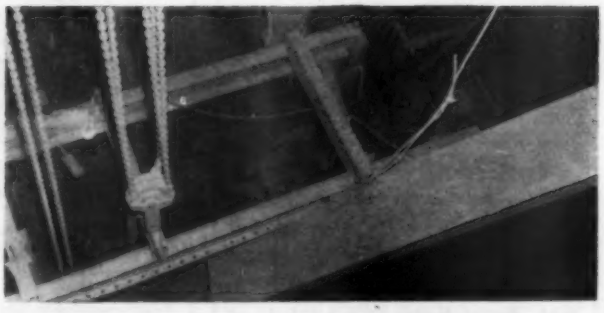

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Johnson March

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USS Lorain Rolled Plate Linings

point to more profitable grinding for you . . .

SERVICE-TESTED USS Lorain Rolled Plate Linings are designed right and made right of the right kind of steel to save you money on each ton you grind. They cut down considerably on mill "down time" because they last much longer than cast linings and they are so easy to replace when it finally becomes necessary.

There are USS Lorain Rolled Plate Linings made to fit any type of mill—for wet or dry grinding. Be prepared for your next replacement . . . send today for names of leading mill manufacturers who can supply you with USS Lorain Rolled Plate Linings.

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1. Plates are interchangeable. Heat treating compensates for localized wear. You get complete grinding value from each plate.

2. Plates made to accurate size . . . go in faster, easier.

3. Tight fit between plates and between plates and lift bars eliminates shell wash and allied troubles.

4. Support for bolt head is near bottom of bar . . . bolts are effective for life of the lining.

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USS LORAIN ROLLED PLATE LININGS *and* USS GRINDING BALLS

4-2286

UNITED STATES STEEL

● In 42 years of exclusive worm gear manufacture, including hob making experience, Cleveland has developed its engineering and production facilities to establish accurate duplication of parts as standard practice.

Photo shows typical hob and gear setup in a hobbing machine.

CLEVELANDS save you money on replacement parts

NOT once in a thousand times will this happen—but, with Cleveland you can order a new gear which will run correctly with an old worm that's still good after working perhaps 20 years or more. That's the kind of service you can expect from Cleveland—and here's why!

At the Cleveland factory are stored over 1,300 *different* worm gear hobs and master worms. This enables us to duplicate with precision any gear (or worm) that has *ever* left our plant. This means that if a gear *alone* should ever need replacement, you do not have to buy a complete new drive. Instead, just give us the particulars on your Cleveland speed reducer, no matter how old—10, 20, 30 or even 40 years! In short order, we'll have a new gear ready for you—one that will run perfectly with the older worm.

By supplying parts on this basis, Cleveland may be able to save you the cost of a *complete* new drive or the extra expense of special tooling. Isn't this the replacement protection you want when you buy worm gear drives? The Cleveland Worm and Gear Company, 3280 East 80th Street, Cleveland 4, Ohio.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.

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Worm Gear
Speed Reducers

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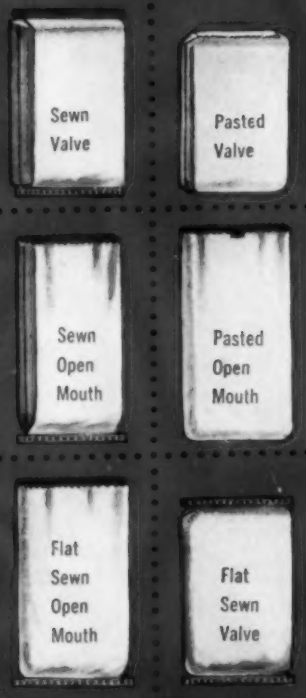

Our 2 completely integrated plants enable you to eliminate large bag inventories and operate on shorter supply lines

Because we are one of the few completely integrated bag producers in the United States, with one plant in Gilman, Vermont, and another in St. Marys, Georgia, we are ideally situated to deliver any type of multiwall bag you need, from either plant.

1 Responsibility

2 Integrated Plants

3 Generations of Bag Experience

Gilman PAPER CO.
- St. Marys Kraft Corp.
- Gummed Tape Div.
- The Gilmanized Corp.
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